

**'ANTIA WAS A SOPHISTICATED BLEND OF
INTELLECT, HUMILITY AND COMMON SENSE.
HOW OFTEN DO YOU FIND SUCH A MAGICAL
COMBINATION IN A HUMAN BEING?'**
—KAVERY NAMBISAN

NOSHIR H. ANTIA became a doctor by accident. He wanted to be a forest officer like his grandfather and uncle. But life took a different turn once he chose medicine as his profession.

From a modest beginning in Huhli, he became a pioneer of plastic surgery in modern India and established one of the earliest burns units in the country at the J.J. Hospital in Bombay. Soon, he realized that 'health' could not be the domain of medical science alone, but needed to be framed by the social, cultural and economic perspectives of the common people. He and his team began training women volunteers in Mandwa and Malshiras—an experiment that became the blueprint for the Community Health Workers' Scheme. Combining scientific temper with social vision, he set up the two complementary organisations, the Foundation for Research in Community Health (FRCH) and the Foundation for Medical Research (FMR). In this candid and critical account, Antia is unsparring of the medical profession and laments the emergence of the 'health industry' at the cost of 'health for all'.

Antia's honest, witty and simple tale reveals that there was more to him than just the scalpel.

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a LIFE of CHANGE



The Autobiography
of a DOCTOR



NOSHIR H. ANTIA



A LIFE OF CHANGE

Noshir Antia was born on 8 February 1922 in Hubli. After graduating in medicine from the Grant Medical College he joined the Army Medical Corps during the Second World War. After the war he went to England to study surgery. On his return, he pioneered plastic surgery in India. His interest in biomedical research and the social aspects of medicine grew while working at the J.J. Hospital in Bombay, and led him to establish the Foundation for Research in Community Health (FRCH) and the Foundation for Medical Research (FMR). He received numerous awards including the Padma Shri in recognition of his efforts in diverse fields.

He died in Pune on 26 June 2007.

A Life of Change

The Autobiography of a Doctor

NOSHIR H. ANTIA

*To my dear wife, Arnie, the rest of our family
and the people of Bharat*

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Foreword

As a student of the medical college in Trivandrum in the 1950s, I heard glowing accounts of plastic surgeries performed by Dr Antia at the J.J. Hospital. We had no opportunity to observe plastic procedures in Trivandrum then. It was a quarter century later that I saw him at a meeting chaired by Professor Ramalingaswamy at the Indian Council of Medical Research (ICMR) headquarters. To my surprise and contrary to one's expectation of a super specialist, Antia decried the glorification of curative medicine on that occasion and made a fervent appeal for refocusing health policy on the social realities of India. It was obvious that he had unbounded faith in the native wisdom and decency of ordinary Indians and profound concern for their welfare. Indeed, the golden thread that runs through the many stellar achievements of Antia is his unflagging concern for fairness and the relief of human suffering. Though steeped in the scientific traditions of modern medicine, Antia refused to be dazzled by technology, which, according to him, is a good servant but a bad master.

Antia's life and beliefs were moulded by his birth and upbringing in the small town of Hubli, and the opportunity he had of mixing with the downtrodden in a government

school. Despite the poverty and deprivation in Hubli, he enjoyed his school years and learnt to celebrate the egalitarian atmosphere of the school as much as he prized the joys and comforts of a generous home. 'The Child is the father of Man', and the childhood experience of simplicity in rural life played no small role in shaping Antia's attitude to the practice of medicine. After graduating in medicine from the Grant Medical College and serving a short stint in the army, Antia moved to Britain where he served in British hospitals for nine years when the country was recovering from the devastation of the Second World War, and luxury and waste were frowned upon in the health service. The UK period introduced him to the legendary Harold Gillies, the father of plastic surgery, who undoubtedly inspired Antia's choice of a career in the new speciality. Similarly, the experience he gained in the management of burns at the Birmingham Accident Hospital and with A.B. Wallace in Edinburgh had much to do with the burns unit he pioneered at the J.J. Hospital. The seeds of clinical experience and investigative medicine which were planted in the UK flourished to produce a rich harvest on Antia's return to India. Gillies, especially, was the guardian angel who inspired and supported Antia through personal visits, and helped in the establishment of the famed Tata Department of Plastic Surgery (TDPS). Antia's tryst with leprosy and the turbulent story of building TDPS against heavy odds make for an absorbing read even after many years. The organization of the burns units at the J.J. Hospital and Thane, despite opposition from jealous colleagues and wooden administrators, was no less remarkable for the simplification of treatment and reduction in costs. Even if he had done nothing else, Antia's contributions to the facial reconstruction of leprosy deformities and treatment

of burns would have undoubtedly earned him a place in the hall of fame in surgery. His J.J. Hospital years were a saga of courage, tenacity, industry and indomitable will, which should inspire generations of young surgeons as they face the uphill task of building institutions in India.

For all the creditable achievements, surgery could not contain Antia's irrepressible spirit any more than a stable can incarcerate a spirited steed. The correction of leprosy deformities led him to immunological mechanisms, and the quest took him away from the operating room to the laboratories of the National Institute for Medical Research (NIMR) under Sir Peter Medawar in London for two years. Even though 'many doubted the sanity of such a radical departure', the research experience enabled Antia to introduce a research component in the TDPS and, more importantly, to establish the Foundation for Medical Research (FMR) in Mumbai. Antia's example of a surgeon's quest for scientific understanding is reminiscent of John Hunter's statement in the eighteenth century: 'Now, the last part of surgery, namely operations, is a reflection on the healing art. It is a tacit admission of the inadequacy of surgery: it is like an armed savage trying to get by force what a civilized man would get by stratagem.' Antia laments that 'the strange urge to understand the scientific basis of medicine . . . had been almost entirely missing in my medical education in both India and the UK.' This grave defect, alas, continues to cripple medical education in India which remains incapable of igniting the spirit of enquiry among medical students.

Antia's intense interest in the social aspects of health care was triggered during the preparation of the classic ICSSR-ICMR report by J.P. Naik. The interest soon found expression in Mandwa where illiterate women were trained

to provide basic health care for their community. He set up the Foundation for Research in Community Health (FRCH) to support community health programmes, which included Parinche where the broadest concept of health was applied, comprehending rural development and needs. The rural health programmes championed by Antia for many years are among the foremost of those set up by NGOs in India, which have moved of late to the centre stage of the massive National Rural Health Mission (NRHM). The NRHM has been hailed by the Government of India as a 'people's programme' and the FRCH and Antia, personally, were deeply involved in its activities which may revolutionize health care and rural development in India. No wonder he regards this as 'one of my most satisfying achievements towards achieving "Health for All".'

Antia's autobiography tells in a delightful style, laced with humour, the story of an extraordinary individual who distinguished himself in many fields and adorned whatever he touched. The long list of his publications bears testimony to the high quality of his scientific output and the wide range of his interests. The story of his life has great relevance in the 'famine years of the soul' today when the vital dogmas of compassion, quest for knowledge, honour and kinship of all life are eclipsed by a spell of selfishness and greed, which regards medicine as an ally of commerce, commodifies the human body, and rates medical innovations in terms of profitability and physicians according to their professional income. The cacophony of materialistic medicine has drowned the disturbing fact that India enjoyed an intellectual free ride ever since modern medicine came to India, and no medical concept, discovery or innovation from India has made a difference in two centuries to the practice of medicine.

worldwide unlike scores of contributions from abroad such as tissue immunity, antibiotics, organ imaging and heart-lung bypass. If this state of intellectual barrenness is to end, as it must, by the efforts of young Indian scientists and physicians, they desperately need role models to excite their minds and spur them to high endeavours which would bring health for all and glory to science. Antia stands tall as a role model, and his autobiography should be read not only by medical students and the medical fraternity but also by the larger community of sociologists and all others interested in the progress and welfare of Bharat. Antia was eighty-five when he passed away in late 2007, but to his last day he was more active than men half his age, and his mind scintillated and grappled with an astonishing range of subjects from the Schwann cell to rural health. To describe him, one must turn to the Bard:

[T]he elements
so mix'd in him that Nature might stand up
And say to all the world, 'This was a Man.'

May he continue to inspire thousands among us, young and old alike, towards service of our people.

M.S. Valiathan
National Research Professor

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I am equally grateful to my colleague Dr Nerges Mistry who has diligently worked with me for over three decades and provided inputs which could only have been given by someone who has known me as a student, colleague and friend over these years.

I extend my thanks to my various medical colleagues like Dr B.M. Daver and Dr Swaran Arora, besides a large number of individuals from various fields who continue to extend their love and support though many have now started institutions of their own.

My students who are now senior colleagues in their own various fields have provided me much satisfaction. Many, if not most, have been mentioned in the relevant chapters and I apologize to those whose contributions I have failed to include.

I have also been fortunate to have been intimately connected with many eminent persons from various fields who have guided and assisted me.

The major support for my core work has come from the Sir Dorabji Tata Trust, the Godrej and Sheth families. I also wish to thank other major funders like the Ford Foundation, HIVOS, DANIDA, MacArthur Foundation and the department of health, education and welfare of the US for their generous assistance at crucial stages in the development of my various activities.

I extend my gratitude to all the staff of the FMR and the FRCH, many of whom have worked with me for over two decades.

My thanks to those who have painstakingly typed the numerous drafts of this autobiography.

A Modest Beginning

If heredity plays any role in who we become and how we develop, I am fortunate that at least one side of my family had its head and heart in the right place. My mother's family, the Madons, had little money but much wisdom embodied in my maternal grandfather, Rustomji Hormasji Madon, whom we admired and whose values I have tried to live by. My paternal grandfather, Merwanji Nowrosji Antia, on the other hand, was materialistic. He made a fortune in business entirely on his own and was very proud of it.

My grandparents—on either side—lived in Thane, on the outskirts of Bombay (now Mumbai). They lived according to their values—one in a grand mansion, the other in a modest old house, which was rented, in keeping with the simple values my maternal grandparents practised. A happy joint family system prevailed in my maternal grandfather's home, which has kept us cousins, his grandchildren, together even to this day.

My mother, Soonamai, the only daughter among four brothers, was allowed to study only up to the second standard by her mother who wanted her to be a diligent housewife. However, she had the innate wisdom of her father, which book learning cannot impart. My father, Hormasji, was the

youngest among five children—four sons and a daughter. He was a gentle, meek person and was imposed upon by the other members of his more aggressive family. He studied at Sydenham College in Bombay, but did not graduate. He took up a job with the Swiss company Volkart, which took him away from his dominating father to the cotton-growing town of Amaravati where his job was to purchase cotton of the required quality for the company. He thus chose a very different path from his brothers: one a general manager of the Tata Oil Mills in Ernakulam; the second a medical colonel in the British army who eventually married and settled abroad; and the third who worked in a small business house in Bombay.

My parents married in 1920 and I was born on 8 February 1922 in the Tehmulji Nariman Hospital in the area around Bombay Fort. Soon after, when I was just a few months old, we moved to Badnera, about five miles from Amaravati. Later, when I was about a year old, in 1923, we moved to Hubli, another cotton-growing area of the then Bombay Presidency.

I thus came to know both sides of my family through our annual visits to Thane and found myself more attached to my mother's father. I was not the only one who thought highly of him. All of us in the family still think of him with love and respect. He had graduated from the Poona Engineering College and had joined the Indian Forest Service where he worked for twenty years before retiring. Soon after retiring, he was persuaded by the ruler of Baroda, Sayaji Rao Gaikwad, to take up the post of chief conservator of forests of his state, a post he held for ten years. Sayaji Rao would insist that Rustomji sit to his right at banquets. My grandfather confessed to us that he was concerned about the jealousy,

palace intrigues and politics that went on around him. His own integrity, however, was appreciated, and he finally retired on his own volition and settled down in Thane. He was given Rs 29,000—a good sum in those days—and a horse-drawn carriage (*ghoda-gadi*) in appreciation of his services. He died in 1956, at the ripe age of eighty-six.

By the time I got to know him on our annual visits to Bombay, he had settled in Thane. Later, when I came to Bombay for my medical education, I lived with him in his family home for four years.

My growing years, though, were spent in a very different place and ambience. Hubli (now in Karnataka) was a small town in what was then known as the Bombay Presidency and was an important cotton centre. We lived in what was essentially an outhouse of the Portuguese Club. My father earned about seventy rupees a month. The rent and my school fees were seven rupees each. Another seven rupees went to our old maid, Budhi, who looked after me like another mother. I had a sister, Dosa, who was a mongoloid. She died when she was fourteen years old, after she was badly burnt by firecrackers.

In those days I saw poverty, the kind we do not see today except in some pockets of the country. The majority were reduced to walking skeletons frightened of everybody.

Budhi had only one sari a year, which we provided her. Like most of the poor, she could not even afford footwear. People did not rebel, not because they were afraid to do so, but because acceptance of their lot was part of their culture. Poverty still exists today, on a lesser scale, but it is of our own making though we have enjoyed more than half a century of independence.

My first school was the missionary school in Hubli where I started when I was four or five years old, following which,

I went to St Mary's School in Keswapur run by the Jesuit fathers. Here, discipline was strictly enforced and even minor transgressions were met by a proper dressing-down from Father Fulstopper. Anything major earned one a caning, and since I got caned only once, I suppose I was not too bad. I always stood first or second in class, my biggest competitor being a Hindu boy called Narayan.

When we were in the second standard, both of us got the same marks in the final examination, but the teacher gave him an extra mark in front of the whole class just because he attended chapel and I did not. I rebelled against this practice, not because I had anything against religion, but because I thought it was unjust. I was upset and informed my father that I would not go back to that school. My parents, surprisingly, raised no objection. My father simply transferred me to the Government Anglo-Urdu High School, at the centre of the town.

The years I spent in this school were pleasant. Most of the boys were Muslims. I took Persian as my second language because my grandfather, Rustomji, urged me to do so. I also studied Urdu, which was taught by an old maulvi who was usually dressed in a shabby white coat. We would often liven up a lesson by picking out bugs that were found on his garment!

I did fairly well in my studies. There was not much competition and I rubbed shoulders with boys who were mostly poor and had to walk barefoot several miles to school and back. I used to walk about a mile and a half myself. Since it took long to go home for lunch, my father had arranged for me to have it at the Karnataka Bakery which was opposite to the school and was owned by a friend of his. For an anna I was provided a buttered bun. I sometimes asked for a second one, and felt a little guilty knowing that most of my school friends could not afford even one.

It was a frugal but happy childhood. One did not worry about where one lived and what one had or did. We ran all over the place, we played gilli-dandu and hide-and-seek. I read a lot, though books were hard to come by.

Hubli was a small town—an overgrown village actually. It had several Anglo-Indian, Christian and Portuguese families as well as Parsis. The Madras and Southern Maratha Railway (MSM) workshop was the major employer. Some 150 Parsis were employed in the cotton gin press industry. They were a close-knit community and my mother enjoyed visiting them.

Caste, religion or class never cropped up in my interactions with my friends. I wanted my own children to experience this egalitarian upbringing and tried to get them to attend what the eminent educationist J.P. Naik called 'neighbourhood schools'. But I was firmly overruled by most of the family and my son and daughter went to Bombay's Cathedral School and the Bombay International School. Early influences mould one both consciously and unconsciously, and I think I benefited from my interactions with the common people in my younger days.

When I was about eight years old, my father left Volkart and joined the Railway Institute of the MSM workshop as a bartender, where he served the often rowdy British expatriates who worked as foremen and engineers. There were regular dance nights at the institute and Indians were not allowed. The men would get drunk and go berserk. I remember after one such disturbance, my father called the senior foreman, Mr Ford, who came with his revolver and threatened his drunken employees with dire consequences if they did not behave.

My mother looked after us and fed us extremely well in her quiet but remarkably efficient manner. She was an excellent

cook and good food did not cost much. We ate simple but delicious meals. Jam was a luxury, and occasionally we opened a tin of Australian IXL Jam, which my father sold as a sideline. My mother was a pillar of strength to my father; the same strength that I see in our village women today. They have remarkable self-confidence even under the most difficult circumstances, while the men try to dominate the scene.

My father was good at both tennis and cricket. As a young boy I have memories of carrying a large kettle of tea and hot bhajias made by my mother for both the cricket teams to share during the tea break. The joy was in playing the game than in winning. There was none of the 'killer instinct' considered indispensable in sports today.

Money was certainly not plentiful but we never worried about it. Once my father told my mother, 'Soonamai, what shall we do? Our bank balance is only seventeen rupees.' She promptly replied, 'What's there to be afraid of? We'll eat *channa-murmura*' (gram and puffed rice)! Fortunately, we were not reduced to this spartan diet because a cheque of a hundred rupees arrived the very next day from her brother, Framroz, who worked as a forest conservator.

On our annual visits to both grandparents in Thane, my maternal grandfather would give my mother a hundred rupees with which she bought clothes and other items and stocked them up for the coming year. Though my father earned just seventy rupees a month, we were considered well off since people earned as little as seven or ten rupees a month. My affluent and overpowering grandfather, Merwanji, wanted us to live with him after the death of my grandmother, but I'm glad my father did not accept this offer, except for a year.

I was then in my last year of matriculation and had to continue my studies at the Esplanade High School just above

what is now the Empire Restaurant, opposite the Victoria Terminus (now Chhatrapati Shivaji Terminus). I used to travel by train from Thane every day.

Merwanji Antia was a stern man of rigid habits. Every Wednesday, he would travel by train from Thane to Victoria Terminus, occupying the same window seat in the same second class compartment. He would be met at the station by his daughter Dina and her family. They would have tea and cakes at the Parisian Dairy on Princess Street followed by a visit to the Central Bank.

Every summer he and his wife, my grandmother Meherbai, would holiday at the Fountain Hotel in Mahabaleshwar and would occupy the same room reserved for them. On one such visit, he met Vithalbhai Patel and his brother, Vallabhbhai, the 'Iron Man of India'. During their conversation, my grandfather made a contemptuous and tactless remark, 'These Congress *dhotiadases* [old fashioned Parsis of that era found the dhoti worn by Congressmen particularly annoying], what can they do?' This angered Vallabhbhai, who replied angrily that he would soon see what they would do. Whereupon my grandfather whacked Vallabhbhai—who was to be our country's most eminent leader after Nehru—with his English cherrywood walking stick, which we still possess as a family heirloom!

It was during one such holiday in Mahabaleshwar that my grandmother contracted typhoid and died.

It was not long before my father decided to move away to Poona (now Pune), in 1936. There was no special reason for choosing Poona except that it had a fairly large Parsi community and my mother had several friends there. Also, my uncle, Colonel Piloos Antia, a doctor in the Indian Medical Service, worked in Ahmednagar, which was not

too far away. It was also going to help my education since I was now ready for college. It is interesting to note that as a senior British Army medical officer and in-charge of the Army Hospital in Ahmednagar, my uncle was responsible for looking after the health of Jawaharlal Nehru, Rajendra Prasad and other senior freedom fighters who were imprisoned in the jail at Ahmednagar. We came to know this only after our independence.

I did two years of intermediate science at Fergusson College in Poona from 1938 to 1940. Poona's population was about a lakh then and I could cycle safely, twice a day, from Main Street, where we lived, to Fergusson College. We lived in a small flat above a chemist's shop, which still exists, at the end of Main Street.

My father, a remarkably poor businessman, opened a small shop in the middle of Main Street called Universal Presentation Novelties that sold knick-knacks and toys. During the war years, when all the other shopkeepers increased their prices by 200 per cent because the influx of British soldiers drove up profits, my father made an increased profit of just 25 per cent, and that, he felt, was unethical. Our home was a small but happy place thanks to my mother's genius for making everyone, including my friends, feel comfortable and welcome.

I graduated with a BSc in 1940 and had to decide on a career to pursue.

My first choice as a career was the forest service, as I wanted to follow in the footsteps of my maternal grandfather Rustomji Madon, and his son and my uncle, Framroz. But both dissuaded me, saying there was not much of a future in it any more. So my next choice was engineering, but my poor mathematics put paid to that career. Medicine was really

the third option and the 56 per cent I had obtained in my BSc from Fergusson College was quite adequate to get me admitted into any medical college in Bombay at that time.

I joined the Grant Medical College in Bombay in 1940. It was one of the oldest medical colleges in the country—a happy and friendly institution where friendship and sports were considered as important as the study of medicine. The Western system of medicine was taught and practised, while all other systems like Ayurveda and homoeopathy were frowned upon. The Western system consisted of basic medicine and surgery with a strong clinical base. The drugs we used were chiefly simple remedies, of herbal origin, such as aspirin (willow bark), quinine (cinchona), opium, and various tinctures like that of asafoetida, iodine and other natural products, and compounds like digitalis (foxglove). A few synthetic drugs like sulphonamides had just been introduced as were a few new surgical techniques that had been developed during the Second World War. Surgery was of a very basic nature but served the requirements of most problems of the patients.

Thorough clinical examination and a few simple tests were sufficient for a reasonably correct diagnosis for the vast majority of patients. Salvarsan was the chief intravenous injection for syphilis. Calcium gluconate gave a feeling of warmth, which was much appreciated by patients and was thus administered often, though it had no other remedial role. Sulphonamide was the magic drug that had just emerged during the war. Penicillin was on its way. Simple chloroform poured on to a cotton face mask was the prevailing anaesthesia and a great boon to surgery.

My interaction with penicillin is worth a mention here. It was discovered in 1944. The first time I saw this antibiotic

being used was at the C.J. Ophthalmic Hospital in the J.J. Hospital. As students we had to attend a certain number of eye operations conducted by Dr Nanavati, the senior ophthalmic surgeon. With him one day in the operating theatre was a British medical officer. We students listened to the two doctors discussing the wonders of a new drug, which the British ophthalmic surgeon had brought with him. At the end of the operation on the tear duct sac (dacryocystitis) the British doctor opened a Petri dish in which there were small pieces of gauze coated with a green fungus grown on jaggery. Dr Nanavati picked up one of the fungus-coated gauze pieces with his forceps and inserted it into the infected tear sac, which he had just cleaned. The two surgeons discussed this new magic cure for such infections. Only later did we realize that this was the crude penicillin fungus *Penicillium notatum* which the doctor had brought from England.

A couple of years later, penicillin, in the form of an injection, was available for use in our wards. It was scarce and hence expensive. As students, we had to inject 15,000 units every three hours into patients who often came to us in the last stages of pneumonia or peritonitis. The dramatic improvement within a few days had to be seen to be believed.

Years later, in 1956, I attended a lecture by Alexander Fleming, the discoverer of penicillin, at the B.J. Medical College in Pune. The hall was packed to capacity with students, doctors and the general public—all keen to hear about the discovery of the medicine.

Instead of describing how he had discovered this wonder drug, Fleming's entire lecture warned us against misusing it. He pleaded, even at that early stage, that penicillin, which was being used in mega-doses, would inevitably result in resistance to the drug within the next few years. If this could

be prevented, he said, penicillin would remain a panacea for another century. He said that it would be the drug of choice if not subjected to gross misuse, as was already beginning to happen. I have been privileged to see the very beginnings of the antibiotics era and the wonders that it could achieve. Unfortunately, market forces have captured the medical profession, leading us to the end of the dramatic antibiotics era.

I studied medicine at a time when caring for patients was as important as curing their diseases. Careful documentation of the patient's history and thorough physical examination often yielded a remarkably effective diagnosis without resorting to expensive investigations as is the practice today. Dr Fali Moos, superintendent of the G.T. Hospital in Bombay was my first clinical teacher. He taught us how to carefully elicit the patient's history followed by equally careful examination and simple investigation of the patient. For example, typhoid can be detected early by observing the 'rose spots' on the patient's cheek, an early sign of the disease. An examination of the patient's stool is also revealing.

It is unfortunate that doctors today hardly look at, or even listen to, their patients. They prefer a battery of investigations regardless of the cost and ability of the patient to bear such expenses. Feeling the pulse, taking the blood pressure and auscultation with a stethoscope are as much an expression of human concern as the information they provide. Indigenous systems of medicine like Ayurveda have taught us the importance of the relationship that exists between the mind and the body. Unfortunately, modern Western medicine understands disease only as a physical phenomenon without realizing the importance of the relationship between the mind and the physical body. We fail to appreciate the love and care

that doctors used to provide which contributed greatly to the healing process. There was implicit faith between the patient and the doctor which is lacking today.

The main surgical specializations at the time were ophthalmology, ENT (ear, nose, throat) and dentistry. As medical students in the early 1940s, we had to undergo two years of study in anatomy and physiology, which I now think was unnecessarily prolonged and resulted in a disjointed form of education. For example, while one student would be dissecting the foot, another would be dissecting the head and neck while the lecture would possibly be on the vertebral column. In physiology, too, while the practical may be on one area, the lectures would be on another. This disjointed method of education was more for the convenience of the college and the teachers than for the students.

It was much later that the concept of 'integrated teaching' was introduced in medical education. It was pioneered jointly by a professor of anatomy and a professor of physiology of Birmingham University in the United Kingdom. Both were army doctors during the Second World War. Marooned for nine months in the famous siege of Tobruk in North Africa, they devised a joint course of training in anatomy and physiology, and came up with an integrated course for pre-clinical education.

I met them in 1947 in Birmingham, while I was on my fellowship. Dr B.M. Desai, our anatomy teacher and later the dean of the B.J. Medical College, had requested me to meet them and find out more about this integrated course in pre-clinical education. They described to me how they had evolved this practical method of education, which I passed on to Dr Desai.

I have always found that adversity is the stimulus for original thought and action. If you are given everything on

a plate, it stymies original thinking. If you are provided a car, a big hospital and all other facilities, you generally stop thinking. The equipment and facilities make you think along *their* lines like Frankenstein, swayed by scientific discoveries, creates a monster in Mary Shelley's novel.

For necessity is the mother of invention. Comfort is an opiate that is irresistible and demands more and more. When something does not work, the answer generally lies in doing the opposite, not in repeating the mistake. We talk about lateral thinking, but it is actually about-turn thinking. These two doctors, marooned in the midst of a war began to look at ways of learning from the student's point of view and came up with a new method in teaching. It taught me a valuable lesson in original thinking, something that is rather in short supply today.

Army Days

When I was in my second year at medical college, I almost exchanged the scalpel for a pair of wings. In 1941, the war in Europe was at its height and Britain was in desperate need of young, educated pilots. We youngsters were an enthusiastic lot who did not think much of danger or death. One day, my cousin Phiroze Katrak, his friend Hrishikesh Moolgaonkar (who later became the chief of the Indian Air Force) and I, decided to enlist. We went off to the air force's recruiting office at Azad Maidan in Bombay, and were accepted straightaway.

Moolgaonkar, of course, went on to make a distinguished career in the air force. Phiroze, too, made flying his career. He took part in the Battle of Britain and later became a pilot with Air India. I, however, was prevented from joining the air force by my uncle, Colonel Piloos Antia, who was annoyed that I was leaving medicine. He wanted me to join the Indian Medical Service like him and not the air force. He called the then dean of Grant Medical College, Colonel Jalal Shah, who was his friend (and who later became the first chief of medical services in Pakistan) to stop my recruitment, which he did, much to my chagrin. Medicine was obviously fated to be my profession.

After I came to know that I had passed the MBBS exam, I went to tell my father who was playing cards at the Parsi Gymkhana in Pune as he usually did on most evenings. He was very pleased, but his pragmatic response was, 'Now, you will never have to starve!'

I had no hesitation in deciding where I wanted to work. This was 1944 and the British were recruiting doctors for the imminent conflict in Burma, following the Japanese invasion. They offered an irresistible sum of a hundred rupees a month to final year medical students, who would have to join the army medical services when they qualified.

Thus it was that I got a glimpse of life in the Army Medical Corps. Together with fifty other young doctors, I was posted in south Deolali where we were fitted into uniforms and taught how to march. Some doctors had never worn anything but dhoti and chappal, and had never seen a parade ground. They were attracted by the pay, which was Rs 350 a month for a second lieutenant.

My next posting was at a transit camp near Kalyan on the outskirts of Bombay, in what is now the suburb of Ulhasnagar and was then called James Siding. I was one of three medical officers who had to look after a hundred healthy men in the camp, mostly African soldiers awaiting repatriation to their home in East Africa. There was nothing for me to do, so over the weekends I would go to Bombay to meet my friends at the J.J. Hospital. It was 1945-46 and Bombay was in ferment. The Quit India movement was gathering momentum and there was a lot of enthusiasm around Gandhiji. The naval mutiny had brought the British army out onto the streets. The Tommies stood with Sten guns behind sandbags at the J.J. Hospital junction and shot at pedestrians who pelted them with stones. Some of the bullet marks can still be seen on the outer wall of the C.J. Eye Hospital.

I was posted next at the ordnance factory at Khadki, in Pune, as medical officer. Again, there was not much work since most of the patients were malingerers who complained of non-existent ailments like backaches and stomach-aches, to escape onerous duties. My non-medical assistant, David, solved the problem by punching them in the back and stomach!

Life was dull once the war was over, and I was becoming restless. I had begun to think seriously of going to the United Kingdom to further my training in surgery. I was then posted to the orthopaedic surgery hospital in Aundh (2 IBGH) in Pune. I repeatedly requested Colonel Farouki, who was in charge of the hospital, for a discharge from the army so that I could go abroad. But since I was one of the last to join the service, I would be the last to be released. Fed up of my constant badgering, the colonel ordered my transfer to Jabalpur. I knew that once there, I would be stuck for years so I had to avoid the posting at all costs.

After the war, the Southern Command headquarters had fortunately returned to Pune. The chief of medical services of the Southern Command was General Arnott. I did not realize that walking into the general's office without an appointment was a major offence. Yet one hot afternoon I, a mere captain, walked into the general's office to speak with him. General Arnott was out to lunch so I waited outside his room. When he came back and saw me he asked me what I wanted. I said I wanted to be demobilized. Surprisingly, he invited me into his office and enquired, 'What are you going to do after you are demobilized?' I told him I wanted to specialize in surgery in the UK but had been posted to Jabalpur. Maybe I was lucky to have caught him in a happy mood because he decided to help me.

He called his assistant director of medical services (ADMS), a British colonel, and told him that I wanted to go to England

for further studies, which he thought was a good idea. 'He has instead been posted to Jabalpur. Why don't you arrange for his release?' Arnott said.

The colonel was mad at me but could not say anything in front of the general. Cleverly, the general also added in front of the ADMS, 'If you do not hear in two weeks' time of your release, just write to me.'

I went to Jabalpur and sure enough, two weeks later, my release orders came through. Some years later, after Arnott had returned to England and I was working there, he invited me for lunch to his club, the Athenaeum, in London, together with my uncle Colonel Piloos Antia.

Several doctors, who had joined the army with me from the Grant Medical College, wrote to me, years later when I was in England, asking how they should apply for their release. I wrote back: 'Just walk into the general's office and say you want to be released from the army!'

Life offers many opportunities. People often say they did not have the opportunity to do what they wanted to do. I think it is more a matter of taking the opportunity when it presents itself. If I did not have the courage—or maybe it was stupidity—to go and ask for my release, things may have turned out very differently for me. There were several points in my life when I could have taken a different path, and could have ended up doing something totally different!

I went to England because I wanted to train in surgery. I did not know why I wanted to do surgery. Maybe because it was a specialization with a high profile, and even some drama, and England was the place to do it at that time.

When I left India, I did not have a job to step into in England and the only money I had was Rs 40,000 given to me as a loan from the Sethna Trust. Fortunately, I was able

to earn my living in the UK by working as a houseman in several hospitals for almost nine years. One did not have to worry about work permits in those days. All I had to do was get a letter of approval from the high commission in England. I was thus able to earn enough and return Rs 30,000 to the Trust which generously waived the remainder.

Learning the Ropes in England

An old steamer carried me to England in February 1947. It was used to ferry soldiers during the Second World War. It crammed in some 1,600 people, though its carrying capacity was only about 400. I was quartered down among the machinery somewhere.

The first thing I had to do after I reached London was to find a place to live in. My college friend Dinshaw Ghadiali accompanied me on these house-hunting trips. Prospective landladies looked at us with some apprehension because there were not many Indians around in those days. We eventually found 'digs', as they were called, in Ealing.

Our landlady was a short, plump woman who lived with an older cousin—generally referred to as 'the Crocodile' behind her back, for obvious reasons. But to us, both ladies were very kind and motherly after they had overcome their initial fear of non-white boarders.

England in the 1950s was very different from what it is today. People had suffered during the war, and were compelled to live frugally in its aftermath. Even the king, it was said, stuck to his ration of just one egg a week. Petrol was strictly rationed. Things were basic and simple—no one had the time or money for frills. Yet the work that was being done in the hospitals, as I

soon discovered, was of a remarkably good quality. I was working towards a diploma from the Royal College of Surgeons, and to do this I had to work in various hospitals. The hospitals advertised vacant house posts in the *British Medical Journal* and I would choose where to apply. This way, I secured many interesting jobs in different parts of the country.

I consider myself fortunate to have worked in England during this period because it showed me how much could be achieved with little money and facilities, and without compromising on quality. What I learnt suited my requirements and the requirements of India when I returned nine years later.

My very first job was as locum to an eccentric eighty-year-old Irish doctor who had a general practice on Walworth Road in London, the very heart of cockney land. Most of Dr O'Malley's patients were poor and lacked hygiene. Once, when I was standing in for the doctor, and began to boil a syringe before using it, the astonished patient asked me what I was doing. I explained why it was necessary always to sterilize the syringe. The patient learnt this lesson in hygiene so well that on her next visit, she berated Dr O'Malley for his unhygienic methods, which earned me the good doctor's ire!

Apart from learning about medicine, I learnt a lot about poor patients and the spirit of camaraderie between staff and patients. My next job was at the Lewisham General Hospital in south London, where I worked for a year. One winter's day, an old man came in saying he had fractured his arm. It was actually an old fracture with which he used to fool young house surgeons like me. I got him admitted and the nurses washed and looked after him with great care. About a week later, as I was doing the rounds with my chief, Dr Jemison, he spotted this old hobo and the two of them stared at each other for a few seconds. The hobo just got up and walked out. I learnt later

that it was a sort of routine annual exercise for these homeless people to seek the shelter and warmth of various hospitals in winter on some pretext or other. The staff knew what was going on, but would not chase them out. Medicine had not become impersonal then and the nurses and the members of the staff cared for the patients and were tolerant of their foibles.

With Britain just recovering from the ravages of the war, there was no money to build glittering hospitals. The Birmingham Accident Hospital (BAH), where I also worked, was housed in a hundred-year-old building. Yet the work that was done here was excellent. It had earned by then an international reputation for treatment of accident injuries and burns. The equipment and facilities they had were not sophisticated but they were highly functional. Many years later, Douglas Jackson, head of the Burns Unit, came to Bombay to inaugurate the Burns Association of India at the Sir Jamsedji Jejeebhoy (J.J.) Hospital, where I was then working.

In the six months I spent at the BAH's famous Burns Unit and a similar period at the Accident Unit, I learnt that it was the motivation and efficiency of the doctors, nurses and the rest of the team that accounted for the remarkable efficiency of this and similar institutions. The staff of the National Health Service, Britain's efficient public health system, were all full-time employees.

The different model that has evolved today has been influenced largely by two institutions that were devised at Bretton Woods after the Second World War. The World Bank and the International Monetary Fund impose conditions even on the exploited, impoverished, newly independent and economically vulnerable countries of the world. This is the modern form of colonization. The newly independent countries do not need charity, but to be left alone to solve their own problems.

In the nine years I spent in the UK for my postgraduate studies, I had the opportunity to meet and work under a variety of eminent surgeons and understand various aspects of surgery. I worked in eleven hospitals and with many doctors, some of whom were famous in their fields. I also encountered patients from various classes in different parts of the country.

Some of the doctors I worked with were highly individualistic and even eccentric. At the Birmingham Accident Hospital, I was registrar to Ruscoe Clarke, a well-known orthopaedic surgeon. He had a Jewish assistant named Joshua Horn. Both were excellent surgeons and staunch communists. Many British intellectuals in the 1950s sympathized with the Left. Ruscoe Clarke's operations would be carried out simply, elegantly and, above all, at great speed, because at five o'clock in the evening he would be out of the hospital and, standing on a soapbox opposite it, harangue the crowd about communism!

Joshua Horn later went off to China and worked for fifteen years in Beijing and started the first accident hospital in China. I met him many years later on one of my subsequent visits to the UK. He had seen both the old and the new China. He could not face the new capitalist avatar and had returned to the UK.

Equally enlivening were the patients I encountered. In Birmingham, in the industrial heartland of England, the 'Brummies', as the inhabitants of Birmingham were called, were tough, no-nonsense people with a sense of humour. I once asked a patient to show me his other foot to compare it with his injured foot. 'Sorry, doctor, I can't,' he replied, 'I have only washed the injured one.'

I worked in Lancashire for some time where one of my patients was a small-time farmer who came in with a bad

attack of jaundice. I had operated on him thrice, but his health continued to deteriorate, so finally I asked my chief to take over the case. But the old farmer objected and said, 'He (pointing at me) has operated on me three times already, and knows my insides better than you, so I want him to operate on me.' As he was wheeled past me on his way to the operating theatre, he put out his hand and said, 'Good luck to *you*, doctor.' Unfortunately, the plucky fellow died.

I earned around £200–300 a year, which was adequate, as food and lodging were provided for by the hospital. Earn and learn was my motto.

It was not a case of all work and no play. I made many friends with the doctors and nurses and we would go out together in the evenings and even on holidays. Yet I had no doubt that I would go back to India, and I knew that nobody was going to accompany me back. I enjoyed myself without the danger of serious relationships.

Whenever I saved some money, I set off for Europe, often on my motorcycle with my friends Alan Mayhew, a dental surgeon, and Wilfred Waldie, an orthopaedic surgeon, in the sidecar. We thought nothing of spending a night on a tarpaulin on the banks of the Loire River in France as all hotels and pensions were full up in the August holiday season. I also used these frequent trips to visit various surgical centres in Europe and made several friends there.

In the 1950s there were places in Britain that reminded one of Dickens's England. Batley, near Leeds in Yorkshire, was like an eighteenth-century industrial township. I served as a locum there for six weeks in the winter of 1952. The town was situated in a valley, which was wrapped in perpetual smog emanating from the mills that produced 'shoddy', a very coarse woollen cloth. The streets were paved with cobblestones over

which water from the mills flowed, often into the houses of the workers. Not surprisingly, a majority of the people suffered from arthritis and chest ailments.

The hospital where I worked was situated higher up on the Yorkshire moor, where the proprietors of the mills and their managers lived in great style, in brilliant sunshine with Rolls Royces in their porches. I had no idea what life was like in the valley until I went down through the dense smog and discovered that almost half the people under the age of forty had severe rickets. I had never seen an instance of mass-scale rickets anywhere. It results from vitamin D deficiency, which is caused by lack of exposure of the body to sunlight. The inhabitants of Batley lived in this perpetual smog emitted by the mills and never saw the sun. One way of controlling rickets was to vitaminize butter with vitamin D. However, no attempt was made to clear the cause of the disease, which was the smog and poor living conditions. We do something similar here in India. We are now medicalizing, not eradicating, poverty. We do not remove poverty; instead, we build big and expensive hospitals to deal with its results. This is proving to be a lucrative business because there is no consumer resistance.

The presiding deity in the hospital at Batley was Lord Moynihan of Leeds, one of Britain's most famous surgeons. He had devised a heavily curved gold-plated needle for the manual suture of wounds. It may have been a wonderful innovation, but if you did not know the technique, you usually ended up, like I did, piercing your thumb. In exasperation, I once asked who was 'the damn fool who devised this needle'. My remark was met with a deathly silence!

There were not too many Indians in Britain in those days. So we did not encounter overt exhibitions of prejudice. But

one had to put up with subtle manifestations of it. One of my medical colleagues at Batley, the son of a priest, had always been friendly, but, unknown to me, he harboured serious fears about the state of my soul. I discovered this when, one Christmas Day, he looked pityingly at me and said, 'I'm sorry, but there is no real salvation for you.' I was more amused than offended by his narrow view of salvation.

As surgical officer at the Royal Infirmary at Preston, in Lancashire, I was deputed to work as registrar for six months to Ian Orr who had been a missionary surgeon in India for thirteen years and had ended up as a brigadier in the army during the war. Despite being a missionary, he was arrogant and once told me, 'You will go back and, ten years later, you will still be doing the same operation you have learnt here.' The implication was that as a mere 'native' I would never have the originality or ability to do anything different. There may be some poetic justice in the fact that about ten years later, he wrote to me saying he wanted to visit his son in Bombay and would I send him an invitation to give a talk so that he could get a tax exemption!

I was also registrar to another senior surgeon at the Preston Royal Infirmary, Cunliffe Shaw, a typical British squire, who looked down on the proletariat and so would often allow me to operate on his less well-off patients while he went off with his girlfriend to the Isle of Man. He would let me do anything I wanted because he couldn't care less about the patients or what happened to them. He once asked me, 'Do you know why the *Lancashire Evening Post* is the most popular paper?' I said maybe because it conveyed good news. 'Because it is a good paper to eat fish and chips on,' was his contemptuous reply.

At the Bangaur hospital, an annexe of the Edinburgh University, situated roughly between Edinburgh and Glasgow,

I worked under A.B. Wallace, a plastic surgeon, famous for his 'exposure' treatment of burns. He initiated this treatment because it was nature's way of healing the surface after such injuries. He believed that application of ointments and bandages merely replicated the microbiologist's method for culturing germs and making them drug resistant. A micro-organism multiplies every twenty minutes, producing almost 1,00,0000 organisms in twenty-four hours. Wallace hence suggested leaving the wound open. Nature forms its own dressing over a wound in the form of a plasma crust and exposes the germs to fresh air and light at a cool temperature so that they cannot multiply. Efforts must be made to nurture the crust rather than the micro-organisms.

Wallace had a perpetually enquiring mind even though he had poor surgical technique. People from all over the world came to study his radical new approach to the treatment of burns.

With the advent of penicillin, Wallace used this new wonder drug on burns, and mentioned this in one of his publications. But he soon found that this form of treatment resulted in the formation of a thick crust, which negated nature's healing process. He thus reverted to the original exposure treatment. Visiting medical professionals were, however, surprised that he had rejected a marvel of modern science like penicillin and, much to his annoyance, quoted his own book back at him. Such is the power of the written word.

Many doctors I worked with in England influenced me in various ways, but none as much as Sir Harold Gillies. My interest and expertise in plastic surgery, which was to occupy me for many decades, and bring me recognition, owes a great deal to the man who is acknowledged as the father of modern plastic surgery. When I applied for the post of house surgeon under Gillies at Rooksdown House near Basingstoke, I did not have

the faintest idea about plastic surgery. It was new in England and unheard of in India.

I remember my first meeting with Gillies clearly. It was 13 March 1950. I was ushered into the presence of this old man scrubbing up in a corridor that had been walled off to form two operating theatres. The hospital administrator introduced me as a prospective house surgeon.

Gillies asked me where I came from. 'From India,' I said.

'I don't like Indian patients,' was his abrupt comment.

It turned out that a maharaja had recently consulted him in Harley Street, and had then gone on to visit two other British plastic surgeons, but finally got himself operated on in New York!

Fortunately for me, Gillies's prejudice did not extend beyond the maharaja and he accepted me as one of his house surgeons. I learnt from him not just technique, but also the attitude of a surgeon.

Gillies was a surgical genius and very unorthodox as a person. He had a knack for looking at most things from an entirely different point of view. He always wanted to know what would happen if he did the same old thing in an entirely different manner.

He was a well-established ENT surgeon at the famous St Bartholomew's Hospital in London when he was deputed to undertake facial surgery for those wounded in the trenches of Flanders in the First World War. He treated 11,000 facial injuries, by arranging to have them transferred first to the Aldershot Hospital and then to Queen Mary's Hospital at Sidcup in Kent. Queen Mary's Hospital became the first plastic surgery centre and service in the world, and a new surgical speciality was born.

In order to ensure that soldiers with facial injuries were transported from the battlefield directly to his hospital, Gillies

bypassed the bureaucracy by a simple but ingenious method. He made out labels that read on one side, 'Send this patient to Harold Gillies at Sidcup', and on the other side instructed that all injuries of the jaw must be nursed in the face-down position. These labels were given to the War Office and soon many injured men began landing up at his hospital with his labels fixed to their uniforms. This saved many lives by preventing the tongue from falling back and choking the patient with blood.

Gillies's first book, *Plastic Surgery of the Face*, published in 1920, demonstrated the excellent reconstruction of facial deformities by various original techniques devised by him, many of which have not been excelled even to this day. Surgeons from all over the world came to see him work as his fame spread.

Gillies did not develop 'models'. He used sound, basic surgical principles of wound healing, such as gentle cleaning of wounds with soap and water, and delicate handling of tissues with 'hooks' rather than crushing them with forceps. He knew that it is nature that heals wounds and the surgeon's job is to help, not hinder nature. His principle was to replace in both quality and quantity the tissues that were lost, often determining the extent of loss after correcting the distortions, using the 'mind's eye', a euphemism for acute observation.

One of his most famous innovations was the 'tube pedicle', besides devising ingenious local skin flaps, in what he considered was a constant battle between 'beauty and blood supply'. All this was achieved without antibiotics or sophisticated anaesthesia delivered by Sir Ivan Magill, a general practitioner from Liverpool delegated to work with Gillies. It needs to be emphasized in today's over-sophisticated surgical environment.

After the First World War, Gillies went on to develop the new surgical discipline of plastic and reconstructive surgery for civilian use, such as for congenital deformities, hand injuries and burns.

He had a great sense of humour and played practical jokes, which could sometimes be embarrassing. He once told us about a wealthy client who wanted a breast reduction operation. He said she 'did not bat an eyelid' when he quoted five hundred pounds as his fee, so he continued, 'for each breast'. Though he practised cosmetic surgery, he did not promote it for he believed plastic surgery was a God-given gift to heal patients. In his biography, *Gillies: Surgeon Extraordinary*, he says 'reconstructive surgery is an attempt to return the patient to normal. Cosmetic or beauty surgery is an attempt to surpass the normal. No man is a plastic surgeon unless he becomes an adept at both.'

During the Second World War, Gillies was appointed by the British government to develop plastic surgery and burns units for his country in view of his unique contribution during the First World War. He developed four centres for this purpose. Most of these new centres were large and well equipped. These he offered to his younger colleagues who wanted to work in such hospitals. Thus, Archibald McIndoe at East Grinstead looked after burnt fighter pilots; Professor Kilner was at Oxford and Rainsford Mowlem at St Albans. But Gillies himself preferred to work in the private wing of the hundred-year-old mental hospital, Rooksdon House in Basingstoke. He wanted to prove that the quality of results has little to do with the size or sophistication of the hospital; it is what you do that matters, developing new ideas and principles. He was opposed to large buildings and unnecessarily sophisticated equipment as it often interfered

with originality. He believed that it is only the 'man behind the knife that matters'.

He was a multidimensional genius. He was a keen golfer and a fly-fisherman of international fame, and often discussed with a patient the finer points of how to tie a 'fly'. He was also an accomplished artist. He abhorred pomp and conventions. Originality in thought and action were for him the spice of life. A thinker and a practical joker, the unusual was the usual for him. He saw nothing strange in one of his anaesthetists coming to work on horseback, or his ophthalmic surgeon riding in on a steamroller. A dog belonging to the anaesthetist, Dr Shakleton, would sit quietly in a corner of the operating theatre hoping for a piece of a rib to be occasionally tossed to it! Rooksdawn House was, in some ways, a totally crazy place, but it produced surgical results of an unusually high calibre.

Fiercely independent, Gillies did not take kindly to being told to do things differently, even when the person doing the telling was the health minister of the country, Aneurin Bevan, who was just trying to be helpful. While relaxing over a cup of tea with us one afternoon, Gillies began grumbling about Bevan, the man responsible for launching the country's remarkable National Health Service in 1948. 'I am going to sue Bevan because he has cast aspersions on my surgery!' Gillies stormed. Poor Bevan had done nothing of the kind. In fact, he had offered to build two new ultra-modern operating theatres for Gillies, who was operating in what was essentially a walled-off corridor with two operating tables. Gillies demonstrated wonderful results in this simple set-up, which doctors from all over the world would come to see. It was his way of demonstrating that there is little relationship between results and facilities.

Bevan, however, was aghast that all these wonders of modern surgery, pioneered in Britain, should have emanated from this modest operating theatre. What would the international visitors think? But Gillies cared little for what anyone thought as long as the results were good.

Unconsciously perhaps, I too imbibed many of his actions and beliefs. I believe that it is possible to do good work in a relatively unsophisticated environment, which I later demonstrated at the Kondhwa Leprosy Hospital, near Pune, where Gillies himself enjoyed operating during his last visit to India in 1959. I had written to Gillies about my work at Kondhwa where I only had the patients to assist me. He replied: 'So what's so great about it? I treated 11,000 facial injuries during the First World War. It is only the man behind the knife that matters. You can do anything, anywhere if you want to.' This is not a sentiment you will hear expressed too often today.

Gillies visited India twice. Both his visits were at my request. The first visit, with his second wife, formerly his theatre sister, was at the invitation of Dr E.H. Coyaji, in November 1957, when he performed many operations at the Jehangir Nursing Home in Pune, and also delivered lectures to various medical audiences including army and civilian plastic surgeons all over the country.

His second visit was in November 1959. I had by then established the plastic surgery unit at the J.J. Hospital in Bombay and Gillies helped it get on its feet. A couple of incidents that occurred during that visit are illustrative of his personality and approach to his work.

He was to operate on a child with a simple cleft lip. She was the daughter of Dr Shah from Baroda. Gillies, as usual, sat in the surgeon's room prior to the operation sketching the

operation he was to perform, intending as usual to improve on existing procedures, to give the little touches and refinements that distinguished his work. This was not unusual for him, but it struck Dr Shah as very strange and he whispered to me in Gujarati, 'Is this the same world-renowned Dr Gillies?' It baffled him that for Gillies there was no such thing as a routine, even for a simple, well-established procedure.

On another occasion, halfway through an operation, Gillies demanded a very fine silk thread, which he required for threading a very fine Swiss needle, usually used in eye surgery, that he had brought with him. We had to tell him that the required silk thread was not available in India. He thought about the problem for a full ten minutes in silence, and then asked for the traditional twisted silk thread from which he teased out a very fine single strand using two straight surgical needles. He then calmly started stitching the wound.

Unfortunately, we do not encourage our students to think of unconventional solutions, and to innovate as Gillies did. Five-star hospitals with their marble facades and array of sophisticated equipments, provide the 'latest' and the most expensive service. It has increased costs astronomically but with hardly any increase in efficiency or effectiveness. At the same time, basic and appropriate surgery is out of the reach of 90 per cent of our population.

The British medical profession still questions this new form of trade in human suffering and hence enjoys much more respect from its people than the medical health service in the United States which, under the guise of science, has converted medicine into a lucrative trade in human suffering. This is being exported even to poor and needy countries with the connivance of its medical industry.

This was entirely alien to Gillies, who not only influenced me but generations of surgeons all over the world—not

only the first-generation disciples like McIndoe, Kilner and Mowlem, but also several succeeding generations, many of whom still practise the principles he initiated. There have, no doubt, been some important advances since his time, such as the transfer of tissue by the superflap and microvascular surgery. These are quantum advances that can be made available to all if appropriately modified and utilized at remarkably modest cost.

In the nine years I worked in Britain I received good overall training in almost all fields of surgery except neurosurgery.

This helped me when I returned to India and began work as a general surgeon at the Jehangir Nursing Home in Pune. Returning to India after nine years of a happy, carefree life was not such a big decision. I never had any doubts about returning to my roots because I knew that so much more could be achieved here. I have never liked the idea of working under anybody, however glorified the position, and in India I could be independent.

I was sorry to leave behind some of my dear friends with whom I still keep in touch through letters and visits whenever I can—friends like Alan Mayhew and Wilfred Waldie, with whom I have enjoyed a long friendship from our days in Basingstoke and Birmingham. I also value my association with a vast number of teachers, colleagues and students who have helped maintain my faith in the inherent goodness and sanity of the majority of our species.

Jehangir Nursing Home

I had always intended to come back to India, to be with my parents, and to use the experience I had gained in the UK for the benefit of our people. In the spartan conditions that prevailed in post-war England I had learnt that there was a lot that could be achieved under very difficult conditions. India was more 'need-based' as a society and so presented an opportunity to do good work in less than ideal conditions.

It was my uncle, Colonel Antia, who put me in touch with his old friend and medical colleague, Dr E.H. Coyaji, who had established the Jehangir Nursing Home in Pune.

Dr Coyaji was a remarkable person. He was only a medical graduate but was extremely well read and had a strong desire to help the poor and needy. He often gave poor patients free medicine and even money. His patients came from all strata of society, including the elite of both Pune and Bombay, who had implicit faith in his medical acumen and, above all, in his honesty and integrity.

He saw his outpatients in a rented building on Main Street (now Mahatma Gandhi Road) where the rich and the poor stood in a queue for his advice. One of his richer patients was the Maharani of Morvi who would roll up to the door in her Rolls Royce, but had to await her turn like everyone else.

Dr Coyaji had also built a simple but effective hospital in an old building donated by the Readymoney family. The Jehangir Nursing Home rendered efficient medical services to all sections of society at a remarkably low cost. The motivation was never profit.

It was here that I began work after returning from the UK in 1955, on a salary of Rs 400 a month. I lived with my parents in their small house. A folding cot in the corridor became my 'room'.

I found ample work in this small private medical institution with its simple but adequate facilities. I had unlimited support from Dr Coyaji and the opportunity to put my training to use. I think it was an advantage to start surgery again from scratch. The only surgical service in the hospital was provided every fortnight by Dr Coyaji's devoted colleague, the famous Dr R.N. Cooper, who was a senior surgeon at the K.E.M. Hospital and G.S. Medical College in Bombay. The Cooper Hospital of the Bombay Municipal Corporation is named after him.

I was appointed as Dr Cooper's house surgeon, but after his first visit, it was he who assisted me in all operations, often asking me to demonstrate the varied skills I had acquired during my nine-year stay in the UK.

It was fortunate that I did not join a large, established hospital where I would have been just another cog in the wheel. I almost did so at one point. I had applied for a post in the plastic surgery department of the most prestigious medical institution in our country—the All India Institute of Medical Sciences (AIIMS) in Delhi, which had just been inaugurated. I went for the interview in Madras (now Chennai). Dr Lakshmanaswamy Mudaliar, the famous physician, interviewed me. Curiously, the interview lasted for

only a few minutes during which nothing of importance was discussed. Forty-five years later, I am still awaiting the result of that interview! I learnt later that a decision had already been made to shift the plastic surgery department of AIIMS to the adjacent Safdarjung Hospital. This was my first—but not the last—experience of how bureaucracy works. Looking at the controversies that have dogged this institution over the years, I am glad that I did not join it.

At the Jehangir Nursing Home, a large room had been converted into an operating theatre with basic surgical facilities; there was a smaller adjacent room for preparation of materials, and an even smaller one for simple plasters and other minor services.

Dr Coyaji was very supportive of my work, as was Dr Cooper. Dr Bomi Billimoria, a well-known thoracic surgeon, would come from Bombay to help me with chest surgery problems such as digital mitral valvulotomy (a procedure for valvular heart disease). I often discussed difficult cases with colleagues like Dr Rusi Ichaporia.

Many procedures that I undertook at the Jehangir Nursing Home were a simplification of what I had learnt abroad and were new to our country, such as porto-caval anastomosis (a procedure to prevent bleeding as a result of cirrhosis of the liver). We worked with simple but effective support. For example, the anaesthesia was administered by Dr Bharucha, an elderly retired doctor from the Railway Hospital (his son, S.P. Bharucha, became Chief Justice of the Supreme Court). Dr Bharucha used the outdated but still useful and safe 'jam jar' technique of ether anaesthesia. This principle was later used in the Epstein Macintosh Oxford (EMO) vaporizer devised by Professor Macintosh of Oxford University.

Macintosh was a dour Scotsman who visited the J.J. Hospital in Bombay when I was working there a few years later. He

was taken to see the large, and generally empty, operating theatres of the newly built five-storeyed hospital. Unimpressed, Macintosh said he had not come to see operating theatres, but actual operations and how anaesthesia was administered during the operations. Since he threatened to depart in a huff, Dr Vinay Bhargav, our senior anaesthetist, brought him to our plastic surgery department, which was housed in a separate building, where he was bound to see surgery in progress.

On the way to the theatre, I showed Macintosh my artist sketching the brachial plexus used for local anaesthesia and our facial prosthesis department. The irascible professor's temper was sorely tried and he flew into a temper insisting that what he wanted to see was an operation in progress. I had a temper of my own, and promptly showed him the door. He cooled down a little, and I took him into the operating theatre where, fortunately, the EMO was being used to administer the anaesthetic. He was delighted that his simple, cheap and safe invention was being used, and spent the next two hours happily explaining to the junior anaesthetists the evolution, safety and efficiency of his invention. Before he left, he apologized for his rudeness.

Unfortunately, the EMO is now disappearing from operating theatres, and is being replaced by the more expensive Boyle's machine. The EMO costs Rs 500 and the Boyle's machine, Rs 15,000. The latter needs cylinders of 'medical' oxygen and nitrous oxide, and calibration of the manometers at regular intervals. The EMO only requires ether and air, and can also be used in rural areas. But the medical establishment always prefers the more expensive and complicated to the cheaper and simpler alternative.

The advantage of Jehangir Nursing Home—a small, compact hospital—was that it provided personalized and

humane service at low cost and in a highly efficient manner. In fact, I was once gently chastised by Dr Coyaji for charging what I thought was a very reasonable fee of Rs 150 for a hernia operation, which he thought was too much.

I learnt to see patients as human beings with social, emotional, economic and other problems. Once, after performing a major colectomy operation on a patient, I had asked him to come for a follow-up appointment. The patient did not keep it. When he came in two weeks later, I was rather rude to him. But when he told me that he had to walk twelve miles from his village since he could not afford the bus fare, I felt ashamed of myself. I wondered how many people would walk twelve miles just a few weeks after major surgery to keep an appointment made without considering the social and economic condition and problems of the patient.

It was while I was at the Jehangir Nursing Home that I started working with leprosy patients at the Kondhwa Leprosy Hospital on the outskirts of Pune. Many deformities caused by leprosy can be corrected by plastic surgery, but little work had been done in this area in India then, except at Vellore. Leprosy still carried a fierce stigma as it was erroneously believed to be highly infectious even by the medical profession. My parents were told by their friends to dissuade me from working with such a hazardous disease. I asked Dr Coyaji, somewhat hesitantly, for permission to borrow Jehangir Nursing Home's surgical instruments, gowns and gloves. I thought he would refuse because of the fear it would create among patients and staff if they knew the purpose. But Dr Coyaji gave me unstinted support and assured me that leprosy was not as contagious a disease as was generally believed.

I also had to discuss my desire to work with leprosy patients with my wife Arnie. We had been married in 1957. She was

a trained teacher of the handicapped and continued with her work after our marriage. She supported me unconditionally. Without this support I may never have embarked on this new area of work, which eventually had major national and international repercussions.

I had the freedom to choose my assistants. My assistant in the operating theatre was a young girl of sixteen, who had just finished high school. Throughout my career I have found that I work much better with people who are not already highly qualified. I can train fresh, willing and open minds more effectively, for they are receptive to new ideas and not confused by a mechanical education. They are also enthusiastic as they are going up the professional ladder. This young girl, Kitty Merchant, with her basic intelligence and keenness to learn, was a much better assistant than the matron, and proved to be one of the most efficient theatre nursing assistants that I have ever had the pleasure to work with. Eventually she could, on her own, undertake simple skin grafts and suture minor wounds. Most doctors considered it unethical to allow unqualified persons to undertake such work. Yet throughout my career I have employed such non-medical but trained individuals with considerable success.

My three years at the Jehangir Nursing Home were satisfying professionally, but they did have their prickly moments. The atmosphere there, restrictive at times, partially prompted me to contemplate a shift to Bombay. The chief reason, though, was Sir Harold Gillies's visit to Pune in 1957. It imbued in me a desire to pioneer plastic surgery in India as he had done worldwide.

I could have developed a plastic surgery unit at the government-run B.J. Medical College and Hospital in Pune, and wanted very much to do so, but other surgeons opposed

it. Fortuitously, Dr Shantilal J. Mehta, my former teacher, who was dean of the J.J. Hospital in Bombay, wanted to start a department of plastic surgery at the J.J. Hospital and the Grant Medical College, my alma mater, was attached to it. It would be one of the first such departments with this speciality in India, so when he asked me to head it, I agreed immediately.

It was thus a combination of factors that made me give up general surgery and devote myself entirely to plastic surgery for several decades. On hindsight, I now believe that all specialists should continue to actively practise general medicine or general surgery with special interest in any subject of their choice. This will be a more holistic approach to medical care than we see today where, increasingly, narrow specialization has created doctors who fail to see the patient as a human being; they see only that part of the patient which concerns them. This is why I insisted that all my plastic surgery students be trained in general surgery before they registered for specialized training in my department even though the university permitted otherwise.

By the time I left the Jehangir Nursing Home in 1958, I was earning Rs 4,000 a month as a full-time surgeon and had been provided a small but very pleasant rented cottage by Dr Coyaji. Though I was very comfortable in Pune, I had this itch to move on to a new destination and work in a relatively new speciality in India. So, though it was difficult for me, my wife and also for Dr Coyaji, who had hoped that I would eventually take charge of the Jehangir Nursing Home, the die was cast and I moved to Bombay.

Tryst with Leprosy

It was in Pune though that I first came to be associated with leprosy. It became the focus of my work soon after I moved to the J.J. Hospital in Bombay. But before I speak more of my association with leprosy some information on this disease is in order here.

Leprosy is an age-old disease stigmatized in every culture because of the unsightly, visible deformities that characterize this disease. In fact, leprosy is far less contagious than tuberculosis. Robert Cochrane, the famous leprologist, has said that if those suffering from tuberculosis wore their infected lungs outside their chest, they would face worse treatment from society. Except for a surgical colleague (who was easily cured due to early diagnosis and treatment), no other surgeon, doctor, nurse or scientist who has worked with me over the years has ever contracted this disease.

Even in the case of couples where one of the partners contracts the florid lepromatous disease and undergoes no treatment, the chance of the spouse contracting the disease is only about 17 per cent. With regular multi-drug treatment, the chance of the disease spreading to others is extremely low provided the shame and fear surrounding this disease is

removed so that patients can come forward for early diagnosis and regular treatment. But though the multi-drug regimen is now widely established, the incidence of new cases persists, mostly at the lower rungs of the society, probably due to the inherent low immunity of these sections of our population to this infection. Early diagnosis by trained village health workers and ensuring regular treatment after confirmation of the diagnosis is the simple yet effective way to control this disease at low cost than the expensive programme followed by the government.

Though the deformity rate has reduced as a result of treatment, the load of those already deformed, and the fear of the disease, will persist for several decades. While surgery provides dramatic results, especially for facial deformities, damage to the nerves associated with sensory loss results in unconscious damage to anaesthetic limbs and resultant deformities of the hands and feet. The Foundation for Medical Research (FMR), an organization I started years later, studied selective nerve damage in leprosy.

Traditionally, missionaries and their institutions have cared for leprosy patients. The disease disappeared from the West even before the availability of the drug Dapsone in 1944, as a result of overall improvement in social and economic conditions in Western countries such as Norway where leprosy was highly endemic. It was a Norwegian, Dr Armauer Hansen, who discovered that the disease was caused by a mycobacterium. In 1973, I attended the centenary celebration of Hansen's discovery, in Bergen, where he lived and worked. I also saw the simple microscope that he had used.

My tryst with leprosy began in 1955, soon after I started work at the Jehangir Nursing Home in Pune. One evening, as I cycled into the foothills surrounding Pune, which I did quite often, I came upon a government-run leprosy hospital

at Kondhwa. It was then on the outskirts of the city. The hospital had at one time been run by missionaries. It was taken over by the government after one of the priests had been murdered. Behind the barbed wire that enclosed the hospital—it was also guarded by an armed policeman—I saw a sea of faces with deformities. I was quite sure, as I looked at the patients huddled inside, that they could be restored to normality using basic principles of plastic surgery.

My reading of the literature available on this subject revealed that an orthopaedic surgeon named Paul Brand had corrected deformities of the hands and feet in leprosy patients, but not of the face. I could find no reports of correctional surgery of the face except for a single case in South Africa.

I was keen to work with leprosy patients, not out of charity for the afflicted poor, but out of an intense desire to explore a major field that was, until then, uncharted in medicine using my experience in reconstructive surgery.

Yet it was not before another two years that I could begin work at Kondhwa. In 1957, Dr Bandorawala took over the Kondhwa Leprosy Hospital from the government and transformed it into a reasonably clean and efficient institution. Later, his son-in-law, Dr Jal Mehta, took over from him and conducted operations here and started a major rehabilitation project with the help of Leela Moolgaonkar, wife of Sumant Moolgaonkar, the legendary head of TELCO (now Tata Motors). Sumant Moolgaonkar provided many types of equipment and placed orders for small components that were to be used in his factory. Dr Mehta's wife, Mehroo (she was Dr Bandorawala's daughter), was a professor of surgery at the Sassoon Hospital in Pune. She was affectionately known as 'Ward no. 9', after the ward she ran with clockwork efficiency for many years.

The same year, my mentor, Sir Harold Gillies, under whom I had studied in England, visited Pune and I took him to see Kondhwa. I felt that the deformities could be corrected with the help of plastic surgery. Gillies left a hundred-rupee note in the visitors' book with an annotation that read, 'For Dr Antia to start a plastic surgery unit at Kondhwa.'

This gave me the impetus to overcome my own fear of contracting this disease and begin work in a field of my interest. On 13 March 1958, I operated on my first case at Kondhwa. It was the correction of a nasal deformity on an elderly lady who was mentally unstable and so, unlike the other inmates, had no fear of subjecting herself to the ministrations of a young surgeon of whom she knew little. The other patients waited to see what would be the outcome of the surgery.

The facilities with which I worked at Kondhwa were minimal. The fear of leprosy among my colleagues meant that I did not have a surgical or nursing assistant or an anaesthetist. The 'operating theatre' was just a glass-enclosed room. It had a folding wooden table, which served as my operating table. My assistants were the patients; one held the torch, another boiled the instruments in a pan, and I encased a third in a gown and gloves and made him my assistant. The absence of electricity and running water did not pose any insuperable problem to an over-enthusiastic surgeon keen to transform the appearance of his patient.

Halfway through the procedure, the ancient folding table broke and we had to complete the operation on the floor! Years later, when I visited the offices of the British Leprosy Relief Association (LEPRA), in London, and casually narrated this incident, Dr Ross Innis, who was present, told me, 'I know why the table broke, Dr Antia. I tied the legs with string some

twenty years ago, when I worked there. I used to take that folding table to undertake deliveries in Pune!'

The operation on the elderly lady was a success, and this was a great boost to the rest of the patients, who soon overcame their undue fear of surgery. True, the cartilage graft landed on the floor, but after a quick wash it was reinstated and worked admirably! I hardly used any antibiotics in Kondhwa for it is nature that heals wounds if the tissues are handled gently and the blood supply is not jeopardized.

In my next case I had to correct a depressed nose. The post-nasal epithelial inlay had to be operated upon. The depressed nose had to be brought forward and supported by a rubberized mould covered with a skin graft from the non-hairy part of the inner arm. This had to be securely maintained for at least three months. Having no dental surgeon to make the mould and fix it on the teeth, as was done in the UK, I innovated on the spot. I heated a loop of wire obtained from a nearby chicken coop, inserted it in the mould and wired it to another wire loop fixed on the front teeth. This simple procedure proved to be more effective than complicated dental appliances and is now used by most plastic surgeons all over the world, with one difference: they use a stainless steel insert and steel wire instead of wire from a chicken coop, and, of course it is far more expensive.

The dramatic result of this post-nasal epithelial inlay was soon followed by a temporal muscle fascia sling for closing and opening of the paralysed eyelids of a leprosy patient, a procedure described by Gillies in 1932 for other causes of such paralysis. Replacing the eyebrows and giving a simple rejuvenating facelift together with trimming of ear lobes showed how plastic surgery could rehabilitate those with the glaring deformities of the face seen in leprosy.

During Gillies's next visit to India in 1959, I brought him back to Kondhwa to see what I had achieved with the hundred rupees he had given us as donation in 1957. He not only approved of my work, but insisted on operating on a patient under the sparse conditions which were no worse than what he had experienced during the First World War.

This was followed by correction of the paralysed hands and feet, all under local or spinal anaesthesia. Later, as part of the rehabilitation process, we designed footwear for anaesthetic feet.

The patients may have been happy with the final results, but sometimes the process scared them out of their wits. One of my patients, a young man called Nabi, was so terrified when I fitted the plaster of Paris face mask on him that he ran out of the hospital and onto the nearby railway bridge. It was quite late at night and I had to chase after him and coax him to come back, explaining that the negative mask was just to maintain a pre-operation record. The effort was not wasted, however, as the face mask, which was sent to the Wellcome Trust Medical Museum in London was eventually instrumental in my being selected for the prestigious Hunterian Fellowship.

I performed all these operations during my tenure at the Jehangir Nursing Home. Soon, a trickle of surgeons started coming to Kondhwa and, later, also to the J.J. Hospital in Bombay, when I moved there, to learn this form of reconstructive surgery—army doctors, doctors from Vellore, Thailand, Papua New Guinea, the UK and the United States, many of them deputed by the World Health Organization (WHO).

After a few months, I managed to get myself an assistant. He was a physiotherapist named Walter Jennings, who had

once suffered from leprosy. His paralysed hands had been corrected by the surgeon Paul Brand. He served us first as a physiotherapist, then as a surgical assistant and eventually undertook the entire tendon transplantation operation on the hand by himself after I had given the nerve block.

This was reported in the *International Journal of Leprosy* and I was accused of encouraging unethical practices by allowing someone with no formal surgical training to undertake a complicated surgery. But Jennings's results were better than my own because, as a physiotherapist, he knew more about the tension requirements of the tendon grafts—the crucial step in the operation.

Even after I went to Bombay in December 1958 to start the first plastic surgery unit in western India at the J.J. Hospital, I would travel to Pune to see my parents every fortnight and also operate at Kondhwa, and was usually accompanied by my students.

The leprosy patients were very happy and proud of the work we were doing to correct their deformities. A touching example of this was demonstrated when two ophthalmic surgeons from Los Angeles, who were visiting the Miraj Medical Centre, requested that I demonstrate the reconstruction of the eyebrows with our new technique of free graft. When I arrived in Kondhwa from Bombay, I was informed that no patient desired to undergo this purely 'cosmetic' operation. Yet, when the news went round that I was to demonstrate this operation to two surgeons who had come from America, six patients immediately volunteered.

In 1960, the president of the Royal College of Surgeons of England, Holmes Sellors, and Benjamin Rank, a pioneer in plastic surgery in Australia, visited Kondhwa while attending a conference of the Association of Plastic Surgeons of India in

Pune. Holmes Sellors had seen Nabi's mask at the Wellcome Trust Museum, and after observing the patients we had operated on and comparing the results with the pre-operative photographic records, he invited me to deliver the prestigious Hunterian Lecture at the Royal College of Surgeons in London. I delivered the lecture on 'Surgery of the Face in Leprosy' in 1962 and received a standing ovation.

My book, *Surgical Management of Deformities in Leprosy and Other Peripheral Neuropathies*, written with Dr Behman Daver and Dr Carl Enna, who spent several months with me in Bombay, records this work. It was published in 1992. Carl would sit in a room on the top floor of the Foundation for Medical Research in Worli, and work with great discipline on the manuscript. He would take a lunch break for just fifteen minutes after which he would shoo us all away and resume his labours. He disliked exercise, as many good Americans do, and Arnie and I could not persuade him to join us for our rather brisk evening walks on the promenade at Worli. On the last day of his stay with us, Arnie fell and broke her shoulder during our walk. Carl was not surprised. 'They walk just too damned fast,' he grumbled.

My interest in several aspects of leprosy led to contacts with leprologists in various parts of India and other countries. I was elected the president of the Indian Association of Leprologists (IAL) from 1981 to 1983. I was also invited to write a chapter on surgical correction of deformities of the face in Robert Cochrane's edited volume, *Leprosy in Theory and Practice*, a classic for the treatment of this disease.

Cochrane, a missionary, was born in China to British parents. He possessed a lively mind and attitude, and a notable scientific temper. He once told me that he hoped to see leprosy reduced in the British Empire before his death.

Some years later he said that this had been achieved 'together with a reduction in the British Empire'.

Cochrane spent six weeks in our department at the J.J. Hospital during which he helped involve several doctors, hospitals and the public to control leprosy. The first conference on leprosy was held at the Bombay University in 1965 during Cochrane's visit.

I have written about my experiences of treating leprosy in several international and national journals, and presented papers at national and international meetings. This helped to widely disseminate knowledge about leprosy and, more importantly, remove the stigma of leprosy, for surgery offers the most intimate contact with the affected tissues.

It used to irritate me to see colleagues wearing gloves when examining leprosy patients. Yet this bravado was sometimes tempered with misgivings and I would often conduct self-checks on my skin sensation or palpate the nerves at my elbow to discern signs of thickening. Many leprosy workers confess to such apprehensions.

My success, I believe, lay in the fact that I was able to break the stigma surrounding leprosy that had hitherto prevented the admission of leprosy patients in a general plastic surgery ward of one of the oldest and most reputable non-missionary hospitals of our country, the J.J. Hospital and Grant Medical College. This has had a countrywide effect. Medical and surgical care of leprosy is now part of the general medical wards of most hospitals in India.

Much of medicine is unscientific myth as is currently demonstrated in the reluctance of the medical profession in our country to admit HIV/AIDS patients to our hospitals, with surgeons demanding HIV tests of all patients prior to surgery. After all, all professions are subject to hazards whether it is a

surgeon or a signboard painter seated precariously on bamboo scaffolding. The fear of doctors contracting diseases they treat has created a substantial market for various protective measures, which has now become a lucrative business for the 'health' industry. This in turn increases the fear and stigma not only amongst medical professionals but also in society at large and has resulted in an increase in the cost of medical care. Whenever the question of risk taken by doctors comes up, I remember the words of Professor Illingworth of the Royal Western Infirmary in Glasgow. He was scrubbing up before undertaking a bilateral adronolog, a major operation, when I asked him, 'Professor, what risk do you take in this operation?'

'The surgeon never takes a risk; it's always the patient who does,' he replied.

Breaking Barriers: The J.J. Hospital

I joined the Jamshedji Jejeebhoy Hospital in Bombay on 1 December 1958 at the invitation of Dr Shantilal Mehta, my old teacher and the dean of the hospital. I was the hospital's first plastic surgeon and was provided eight beds scattered all over the hospital—four in the male ward, two in the female and two in a distant children's ward. No separate house surgeon or registrar was allotted to me, and I used the existing ward staff of other surgical departments. In the two decades that followed, we were able to make many changes and build a department that commanded respect both at home and abroad.

Since this was a government hospital and I was an honorary surgeon, I could not charge a fee from patients. Compared to the Rs 4,000 I was earning as a full-time surgeon at the Jehangir Nursing Home in Pune, my current honorarium of Rs 250 every month was a pittance. In fact, in the first month, I earned just Rs 150 for a cleft lip operation on a patient who was kindly referred to me by Dr R.N. Cooper to my private practice. I worked for the privilege of being attached to my alma mater (the Grant Medical College was attached to the J.J. Hospital), which is one of the oldest and most respected medical colleges and hospitals in India.

Arnie and I started our life in Bombay in two rooms loaned to us by a friend of the family. Initially, we lived out of the boxes in which our belongings had been transported from Pune, until a chance meeting with a wealthy Parsi family, the Seths, resulted in our moving into a reasonably large flat on the first floor of their ancient family house overlooking the sea at Malabar Hill.

It was a difficult period for me, and even more so for Arnie, who supported me without reserve. She had to leave a comfortable home in Pune and the security of a regular income. I now realize the sacrifices she made in order to fulfil my desire of building a new and problematic career in plastic surgery in Bombay. I was deeply attached to my work—the more difficult it was, the more interesting I found it. I had this rather selfish gambler's streak that pushed me to take career risks regardless of the consequences to myself or my family, which had expanded, with the birth of our son Rustom in 1959 and our daughter Avan in 1961.

My outrageous demands were generally tolerated (though not always acted upon). For instance, I argued that both children should go to a neighbourhood municipal school in Bombay. This was anathema to everybody else in the family. Educated in a government school myself, I felt that elite schools alienate pupils from ordinary people and from their own country by inculcating elitist values that are at odds with the socio-economic conditions of the vast majority of our people. This pressurizes youngsters to emigrate to the more glamorous West with its entirely different socio-economic climate, culture, and practices. I was fortunate that Rustom escaped this contagion despite going to an elite school. This was partly because of his habit of undertaking long treks in the Himalayas during his holidays while studying at the

Indian Institute of Technology (IIT) at Bombay. On his treks he came in contact with the poor and their poverty. My daughter, Avan, was a national cycling champion, and often travelled with her team to different places in India and abroad, roughing it out.

We lived in the Seths' house, Shanti, for eight years before we went to England in 1968 to allow me to pursue my interest in biomedical research. Fortunately, soon after our return from the UK in 1970, we were offered a delightful apartment in the pleasant surroundings of Worli, which we bought for a pittance and where we spent almost thirty years before selling it for a fortune when we moved back to Pune in the 1990s. Friends and colleagues had warned me that it would not be possible to survive on the entirely new speciality of plastic surgery. Nevertheless, I succeeded in gradually building a reasonable private practice from the consulting room of my brother-in-law, Dr Maneck Bhagat, an eminent paediatrician, who permitted me its use in the early afternoons. A few years later, I was invited to join one of the most prestigious polyclinics in Bombay at the Ben Nevis building on Warden Road, where I shared a consulting room with Dr Gajendra Sinh, a neurosurgeon. This was closer to my residence in Worli and to the Breach Candy, Jaslok and Cumballa Hill hospitals where I practised. The polyclinic and its eminent inmates were kept in order by the super-efficient Motee Vakil, who often had to chase up my patients to recover my professional fees since I sometimes forgot to do so myself.

As time went by, my work as a pioneer in plastic surgery in the city and the country came to be better recognized, which helped me earn a more reasonable income that was restricted only by the time and effort I devoted to the building of the plastic surgery department at the J.J. Hospital where I was often considered to be a 'full-time honorary'.

Plastic surgery was a relatively new medical discipline in India in the early 1960s. So, when the vast new J.J. Hospital building that had been constructed at the instance of Dr Shantilal Mehta was completed shortly after I started work there, I wanted to obtain a wing in it for plastic surgery. In 1961, the bed strength of the plastic surgery department had increased to sixteen, and a registrar as well as a house surgeon were posted to the department, but the beds were still scattered all over the hospital.

Fortunately, Dr Archie de Quadros, who was then dean of the hospital, wisely advised me against moving to the new building. 'You are a very enthusiastic young man doing new and unusual work, so don't come to the new building,' he told me. He said he would give me two or three full floors in the old Balaram building that would allow me to work independently, without disturbance or annoyance from other colleagues as would inevitably happen in the new building.

I am glad I took his advice because I was indeed able to build independent plastic surgery, burns and leprosy units in isolation from the rest of the hospital in the old building, and in the way I wanted. I was away from the prying eyes of subsequent deans and matrons who felt that I was disturbing the overall pace of development of the rest of the institution.

It is true that the plastic surgery department was developing rapidly. In 1964–65, the Tata trusts gave us a substantial grant to undertake two projects on leprosy and burns, and renovate and refurnish the third and fourth floors of the Balaram building to suit the requirements of the plastic surgery unit, which from then on was known as the Tata Department of Plastic Surgery (TDPS). As work increased, so did the requirement for space and staff. A veranda that

ran along the third floor was converted into a bacteriology and biochemistry laboratory for the burns ward. We had undertaken a survey of burns in Bombay and a few other places in Maharashtra to understand the full extent of the problem, and this brought in social workers. To cope with the increasing load, we took on extra staff; M.R. Keswani and V.P. Buch were appointed assistant honorary surgeons, and Eruch Funibanda joined as honorary maxillo-facial surgeon. When hand surgery was introduced, we obtained the services of a physiotherapist and an occupational therapist.

From the beginning, the department of plastic surgery adopted a total approach towards the patient. It was not just about the correction of a deformity; rehabilitation following surgery was considered as essential, if not more important. When we started a workshop for patients we also required the services of employment officers.

Funds also came in through the PL-480 grants of the health, education and welfare department of the Government of the United States. These were utilized to start a research laboratory for leprosy and burns, and a prosthetic laboratory in 1967. Many researchers, who joined the laboratory as postgraduate research students, later helped me establish the Foundation for Medical Research in 1974.

I was adamant that I would treat the deformities of cured leprosy patients along with other patients in the plastic surgery ward. Leprosy was still a disease that people were unreasonably scared of contracting. Even colleagues well disposed towards me warned me against mixing leprosy patients with others. They predicted that it would create uproar among staff and patients and would also ruin my private practice. I disregarded these warnings and personally wheeled a leprosy patient with a deformed nose into the operating theatre to demonstrate

what plastic surgery could achieve even for this disease. It was the first time ever that a leprosy patient was treated in the general ward of a non-missionary government hospital and medical college.

No doctor, nurse or patient ever objected. This was just another myth propagated by the medical profession. The only objection to my admitting leprosy patients came, ironically enough, from a dermatologist who was responsible for the leprosy department in the hospital! Such myths and phobias are due to the lack of adequate scientific and social understanding of diseases imparted during the course of medical education. So great was the phobia that in the outpatients' dermatology department, a wall had been erected to segregate leprosy patients from others. I just broke down the wall, and again, no one protested at what was, admittedly, blatant interference in another's department.

These experiences proved that if you take the bull by the horns and vigorously push an idea which you firmly believe in, after careful thought and some pilot experimentation, there is cooperation and even appreciation, no matter how unconventional the idea.

I had occasion to demonstrate this when a minister from Karnataka sent a message that he wanted me to perform secondary cleft lip surgery on his twin sons. A letter soon followed from the then health minister of Maharashtra, Dr Rafiq Zakaria, that I should provide 'red carpet' treatment. My response was to ask my senior nurse to indent for a red carpet! Such pressure tactics have never cut any ice with me; on the contrary, I was determined to treat VIP patients like everybody else in my ward. So I asked the ward nurse to place the two boys between my other leprosy patients.

To my surprise the father of the twins behaved in an exemplary manner. He never entered the ward except during

visiting hours and never demanded any preferential treatment. Some years later, when I was passing through Bangalore, he personally came to receive me at the airport and arranged for me to have lunch at his home where he had also invited the health minister of Karnataka. Several senior doctors of the government medical college were also present on the occasion and both ministers stated that they were in favour of leprosy patients being treated in the state's government hospitals. Unfortunately, they did not get much response from the doctors present, who were more interested in using the occasion to seek petty personal favours from their health minister.

The condition of our own state-run hospital, the J.J. Hospital, left much to be desired. I once told the late Rafiq Zakaria, then the health minister, that the state of the operating theatres was abysmal. He said he would make an inspection. I insisted that it should be a surprise inspection and I would take him there myself. On the appointed day, I went to pick him up at his house and was received by a very pretty young lady. In the car on our way to the hospital, I complimented Dr Zakaria on his pretty daughter, only to be told that she was his wife!

Plastic surgery also involved what is more commonly known as 'cosmetic surgery'. One of my patients was Siloo Maneckshaw, the wife of the famous Field Marshal Sam Maneckshaw. She came for a face-lift, which we performed quite successfully. Some years later, she returned for a touch up. It was one of my assistants who prepared her for the procedure, and I discovered to my dismay that instead of just cutting a few locks of her hair, he had cut off a large chunk! Mrs Maneckshaw probably had to give up socializing for a while until the hair grew back.

She took the incident in her stride, and suggested that I visit her husband next time I was in Delhi. Sam Maneckshaw was the army chief then. I made an appointment to see him some months later when I happened to be in Delhi. When I arrived at the house, Maneckshaw was still out, but the living room was full of little children belonging to his Gurkha servants, watching television. After he came in, we chatted for a while and he decided that I should meet someone high up in the government hierarchy. 'Make an appointment for the doctor with the clown,' he told his assistant. The 'clown' was the deputy prime minister of the day, whom I met the next morning.

I am often asked whether patients are actually operated on for the wrong reason or whether it's just an assumption. It does not happen often, but it did happen in one instance. In the century-old J.J. Hospital building, the two surgical theatres were side by side and all patients waited in a common corridor before they were wheeled in. On one occasion, a patient in need of a circumcision and another who needed to get his tonsils out got interchanged. Both operations went ahead, much to the horror of the parents of the two boys who created quite a ruckus when they found out.

I myself was at the centre of a controversy and a lawsuit once in my early days at the hospital when I did not have a ward of my own. I had given explicit post-operative instructions to the nurse that a patient who had undergone a pharyngeal flap procedure should be kept in a face-down position. To my horror, I found that the instruction had been ignored and the twenty-four-year-old patient died after swallowing his own blood. In a towering rage, I yelled at the nurse, calling her a 'murderer'. The relatives of the patient heard what I said and brought a malpractice suit for negligence.

The case dragged on and had as many as nine hearings in the coroner's court. Even the Medical Protection Company of the UK, which handled such cases for doctors, observed how unusual it was to have so many hearings. It later emerged that the case had dragged on because the coroner (who was later caught on corruption charges) and my lawyer had connived at the behest of a rival plastic surgeon. Ultimately, the case fizzled out.

I played a part in what came to be called the J.J. glycerol tragedy, in the mid-1980s, in which twelve patients died at the J.J. Hospital after being administered toxic glycerol instead of glycerine. Instead of acknowledging its mistake, the hospital administration sought to keep it under wraps—a grossly unethical thing to do. I wrote a letter exposing this in the national press, which resulted in the case being probed by the Lentin Commission, headed by Justice Bakhtawar Lentin, the chief justice of the Bombay High Court. The daily press reports of the shocking findings of the commission, and Justice Lentin's caustic comments on the manner in which several important government functionaries worked, created quite a stir not just in Bombay, but nationwide. The Lentin Commission Report was a salutary lesson to the medical profession on the perils of suppressing its misdeeds.

Working in a big hospital had its share of petty squabbles and jealousies. Usually, I was too busy to get drawn into these ego battles and allowed my work to speak for itself. For example, when I had just joined the hospital, a senior surgical colleague had declared that he would not refer any case of cleft lip to me since he was sure that he had performed far more operations than I had. But within six months, he brought his own nephew to me for an operation for a cleft lip deformity.

Regrettably though, I have clashed with colleagues on some occasions. I had to bar one of the deans of the hospital, as well as the matron, from entering my department because they invariably used this opportunity to obstruct and not help the work of our department.

The ban so aggravated the dean that he threatened to have the leprosy patients removed from our department. He had the support of the hospital's leprologist, who said I was spreading leprosy in the hospital! I confronted the leprologist by demanding to know why he had failed to identify fifteen active leprosy patients who would normally be a part of the 2,000 patients unknowingly admitted to the wards of our hospital. (Statistically, fifteen out of every 2,000 patients admitted randomly to the hospital could have leprosy.) Also, as a leprologist, he should be providing them the necessary treatment. I also told the dean that if he made any attempt to prevent leprosy patients from being admitted in my wards, I would resort to a hunger strike and call the press.

My letters to Robert Cochrane during this period were filled with my anger and frustration at being unable to further my work in leprosy at the J.J. Hospital. There were times when I felt 'totally cheesed off waiting to spend extended periods abroad that would help me to see things in a proper perspective.' In another letter I told him that I felt that 'scientific medicine is not possible in this country.' This pessimism was engendered to a large extent by the then dean of the J.J. Hospital, Dr Virkar, who was undoubtedly a thorn in my flesh. My letter of 9 July 1966 to Bob, as I called Robert, quoted Virkar saying, 'J.J. Hospital is not interested in helping leprosy work' and 'they are not interested in dealing with national problems.' I suspected that the funding that my department enjoyed from the Tata trusts had turned him a little green because

he alleged that our department 'has made the development of the whole hospital lopsided and that other departments should be given priority.'

Another major problem arose when I started getting substantial funds for my department from the PL-480 aid plan of the United States government. These substantial funds were routed through the same obstructive dean, who saw this as yet another opportunity to harass me. Eventually, I was so disgusted with the constant harassment despite all my hard work, that I sought an appointment with Shantilal Shah, the well-known Gandhian, who was then the state health minister.

I was so upset that I could not utter a word as I sat before him in his office, and just offered him my letter of resignation. He refused to accept it, and invited me that evening to his residence where he tore up my resignation letter and asked me how I wanted to have the PL-480 funds routed. He agreed to my suggestion that the funds be routed through the house of Tatas and not through the dean of our hospital.

On the whole, though, my professional relationship with most of my colleagues was cordial. Fortunately, I worked in a separate building where they knew we were up to some unusual work with the substantial funds we were fortunate enough to attract. Though they showed no animosity, I was often irritated by the timorous nature of my colleagues and their reluctance to oppose the dean or even the obstructions of the head clerk of the hospital.

There was also reluctance to do anything that was a little unconventional. Since my department was constantly treating bedsores of paraplegic patients referred from the orthopaedic surgery department, I once suggested to a colleague, who was the senior orthopaedic surgeon, that he should amputate

both the lower limbs of such patients, since they only hampered mobility. It would relieve the patient from carrying unnecessary dead weight, equivalent to half of his or her body weight, and also relieve the pressure sores. I offered to provide a plastic moulded seat and a platform on wheels from our rehabilitation section to allow the patients to move about—a method regularly used by beggars on the streets of Bombay whose legs are often amputated under trains.

My colleague refused to take this—admittedly unusual—advice saying it would cause psychological problems in the patients. He had also refused to amputate the feet of leprosy patients referred to him by my department because he was afraid of contracting the disease. During a visit to the medical college hospital in Kansas City in the USA, I saw that such amputations were routinely performed on paraplegic patients who were thus made ambulatory.

I had also suggested to a colleague in the neurosurgery department that he operate on pituitary gland tumours through the mouth as I could provide him ample access through the palate. But he feared infection. Yet this approach is now a standard procedure for pituitary surgery.

When you undertake any new or unusual procedure you have to convince not only yourself about its safety, but also the patient and your colleagues. Once the benefits are demonstrated, all else follows. At Kondhwa, patients were scared of subjecting themselves to my knife till I demonstrated the good results, after which there was no hesitation.

I have experienced that there is usually a simple, if somewhat unorthodox, solution to many of our problems. As I have described elsewhere, the 'soap and water' treatment and the remarkably versatile 'jhoola' beds for burns patients, or the training of village women in health care, produced

excellent results at remarkably low cost though they sounded strange to begin with. It is a pity that we have lost our ability to solve our own problems and always look to the West for solutions that may be inappropriate for us.

Such thinking is prevalent in the upper echelons of our society. When we trained village health workers, we discovered that they were not at all intimidated by what we expected them to do. This approach does not go down well with rule-bound government babus who try to show their importance by threatening 'action' against you if you dare to break rules that were probably formulated during the British Raj.

Rehabilitation for leprosy and burns patients soon became an area to work on for us at the TDPS.

It was a minor incident that made me think seriously about the rehabilitation of leprosy patients as an essential part of reconstructive surgery. Though working at the J.J. Hospital, I made regular trips to Pune to treat patients at the Kondhwa Leprosy Hospital. On one of these trips, Dr Funibanda, my dental colleague at the J.J. Hospital, who also happened to be an expert photographer, accompanied me. He wanted to film a plastic surgery operation. He called the film *We Live Again*.

The next day, while strolling in Pune city, we came across a group of leprosy-afflicted beggars. Two of them came up to me and thanked me for having corrected their deformities at Kondhwa. Instead of feeling proud of my achievement, I thought that if, even after reconstructive surgery, they were still reduced to begging, my ultimate goal should be rehabilitation, and that surgery was only an incident in the process.

At the Kondhwa Leprosy Hospital, we did have some sort of rehabilitation programme. About 300 leprosy patients, male and female, together with their children, were provided

shelter, food and clothing. Many of them had benefited from my surgical skill in correcting deformities. Despite this, there were several younger patients who were not accepted back into their homes and families and continued staying at the hospital.

When Dr Bandorawala took over charge of the hospital, he started various activities such as weaving of bandages and coarse cloth and carpentry to enable the inmates to earn a living after they were discharged. But even though the gates were now open and they could leave and start life afresh, many preferred the security of the hospital even though they earned a paltry sum of six rupees a month as pocket money.

This voluntary incarceration, which sprang from a real or imaginary fear of facing the outside world, could hardly be termed as rehabilitation. Yet, the patients were grateful. When I left Pune for Bombay, they pooled their monthly allowance of six rupees to give me a small silver platter as a gesture of gratitude—a gift that I value more than any monetary gain or awards. While appreciating this gesture, I felt that the ultimate measure of success would be the acceptance of these patients by their families and society, which would let them earn a wage and help them regain their self-confidence and self-respect.

I had no knowledge or training in the field of rehabilitation and had to devise methods based on common sense and learn from mistakes. But first, I had to find some space in the J.J. Hospital for the rehabilitation work. Fortunately, when Dr Shantilal Mehta was the dean, he had constructed a large building for postgraduate medical research. Except for a few rooms, most of this large building was unused and the rooms were locked, which just showed the lack of interest in research in our medical profession.

I felt that this vacant space could be used for our rehabilitation activities. Since such activity had no precedent

in a medical college, I had to go from pillar to post just to locate the keys of the vacant rooms. Everyone, including the dean, pretended they had no objection to my using the space, yet each one referred me to the head of yet another department for the keys. Fed up of this fruitless exercise, I broke open the locks one day, and occupied several empty rooms. We later also started the medical research work of our department for leprosy and burns in this building.

Our rehabilitation activities had a dual purpose: devising technical solutions for paralysed hands and feet of leprosy patients, and also for deformities from other causes like contractures following burns.

The PL-480 funds proved to be a substantial windfall in the early stages of what were, admittedly, our amateurish rehabilitation activities. They allowed us to offer our patients both physical and occupational therapy, and to devise a variety of aids for rehabilitation.

With the help of Hoshang Pavri, an occupational therapist, and the large plastic footwear industry of Bombay, we devised footwear that had a conventional exterior appearance and concealed the deformities and ulcers of the foot in leprosy, unlike the traditional and ungainly 'car tyre' chappals of Vellore.

We also provided rigidity in the form of a moulded steel shank, provided by the Godrej factory, which helped protect and even heal the ulcers of the feet without the need for ugly and smelly bandages. The plastic footwear could also be washed under a tap. This activity has continued to the present day and such footwear is now used for the anaesthetic foot in diabetes patients and those suffering from other neuropathies. My friend and colleague Dr Frederick Finseth made a film about this footwear during one of his visits.

To me, the proof of our success in rehabilitation was provided by Varyam Singh, a leprosy-affected beggar with multiple severe deformities of the face, hands and feet. After multiple corrections of these deformities in our plastic surgery ward for over a year, we provided him with our footwear, which was still in the early experimental stages. At the follow-up footwear clinic, this once helpless patient held up his footwear, and looking straight into my eyes flung it at me and demanded to know whether I would be prepared to wear something so ugly! The students and the physical therapists were aghast at his boldness and temerity and could not understand why I congratulated Varyam Singh. To me, it demonstrated the ultimate success of surgery and rehabilitation because it had given him the self-confidence and self-respect to speak out.

Since economic rehabilitation is equally important, we also taught patients to produce steel washers for a client in South Africa on a hand-operated press. Though not an economic success, this project taught us how to adapt tools to fit the insensitive deformed hands rather than merely undertake reconstructive surgery.

Electromyography (EMG), a tool for the study of nerve conduction was first established in India at TDPS since leprosy chiefly involves the peripheral nerve, which is responsible for the majority of the deformities of this disease. In 1963, I arranged for our senior leprosy research officer, Dr Shobha Pandya, to go to a rehabilitation centre in New York, and then to Wing Commander Dr C.B. Wynn Parry in London to learn this technique. She returned with a basic EMG machine for our department. I persuaded the Bhabha Atomic Research Centre (BARC) to copy this machine for wider use in India, since there was nothing like intellectual property rights at

that time. The first EMG conference in India was held at the TDPS and chaired by Professor Baldev Singh, a neurologist at the All India Institute of Medical Sciences.

Dr Piroja Wadia, who now heads the EMG Department at the Jaslok Hospital in Bombay, was introduced to EMG by Dr Pandya. Dr Pandya also served as the electromyographer at the Bombay Hospital for almost twenty-five years.

Those who have passed through the portals of TDPS, particularly from the mid-1960s to the mid-1970s, will remember its atmosphere enlivened by the large number of young plastic surgeons from the US, the UK and Thailand who came to the TDPS to learn from the vast clinical material at our disposal. Many stayed with us for several months. I have maintained close contact over the years with some of them.

James Smith came from New York to do research on the peripheral nerve. He brought with him the dual operating microscope sent by the American Leprosy Mission. He also brought this red fluid in a tin, which turned out to be coloured silicone dye. James wanted to study the blood supply to the ulnar nerve and to do this he injected the dye into the blood vessel and studied it under this fancy microscope. He carried out this research on monkeys, and on one memorable occasion, a monkey escaped from its cage in the research department and created havoc in the wards.

Hugh Johnson and Carl Enna from the US as also Jim Evans and William Lennox from the UK, who are now acknowledged authorities in plastic surgery, interacted and collaborated with us at the TDPS. The department was also visited by many senior plastic surgeons such as David Matthews of University College Hospital, London, Dr Herbert Conway, chief of plastic surgery at Cornell University Medical College and Hospital, and Dr John Constable, professor of

plastic surgery at the Harvard Medical School. The World Health Organization often sent us leprosy surgeons from the leprosy hospital in Bangkok.

Among my many colleagues, I remember Suresh Kamat with great fondness. When the TDPS required an artist, we took on Suresh, once a leprosy patient, whose clawed hands had been corrected by Dr Paul Brand in Vellore. In fact, Brand had recommended him. Suresh Kamat was extremely intelligent and in addition to drawing he also took up photography. His photographs of patients and line drawings of operations figure in all my books on surgery. His knowledge of surgical operations was so profound that my students and trainees often invited him to be present during operations to guide them. He died of a brain tumour. With his death I lost a colleague and a friend.

I consider the institutional development of the Tata Department of Plastic Surgery, for twenty-one years, between 1959 and 1980, when I retired, my greatest contribution to my speciality. In December 2006, I was invited to inaugurate the forty-first annual conference of the Association of Plastic Surgeons of India, which began with just five plastic surgeons in 1959, and now has a membership of 1,000. Amongst the 600 surgeons present, I met many—across generations—with whom I had interacted in various capacities—as examiner, inspector of institutions and lecturer.

Innovative Techniques

My sister's death has, perhaps, been the most traumatic experience of my life. She was burnt to death by firecrackers in the Diwali of 1946.

Professionally, I was first exposed to burns when I spent six months as a surgical registrar in the famous Burns Unit of the Birmingham Accident Hospital (BAH) in the UK in 1954.

The renowned Burns Unit at the Birmingham Accident Hospital was run by the British Medical Research Council for the study of microbiology, pathology and epidemiology of burns. It was started by Dr Leonard Colebrook, a remarkable individual with an enquiring mind. I believe he is one of the great unsung heroes of modern Western medicine. As a surgeon-gynaecologist at the Royal Western Infirmary in Glasgow, he was an anguished observer of the havoc wrought by puerperal sepsis, caused by streptococcal infection, in his maternity ward. Taking advantage of the advent of sulphonamides, whose potential was so dramatically demonstrated during the Second World War, he demonstrated its ability to control puerperal sepsis.

The dramatic results he obtained led him to test the effect of sulphonamides on microbiological infections in other

diseases. Burns not only provided a rich source of infections, which could be treated by this new antibiotic, but also allowed him to observe its effect on the skin.

Unfortunately, by 1948, the unnecessary and excessive use of antibiotics like penicillin and streptomycin began to pose a new problem to the medical fraternity as microbes became resistant to a variety of antibiotics, both topical and systemic. This had already begun to annul the early dramatic results of the antibiotic era and led to the advent of a series of new antibiotics, which met the same fate. Hence microbiology together with the study of the pathology of burns and its management by aseptic surgical techniques was a major area of interest for a surgeon such as I who was hitherto trained chiefly in the skin grafting of these injuries. Skin cover was a major advance in the treatment of burns as demonstrated by Sir Harold Gillies, and it had become a well-established, routine procedure.

It took some time and effort for a junior surgeon, as I was then, to appreciate that burn injuries needed research in many different fields. So, when I was asked by an aged observer during one of my routine ward rounds as registrar, whether I would consider switching back to sulphonamides, I showed my resentment at what I thought was an absurd suggestion. I discovered later, much to my dismay, that my interlocutor was none other than Sir Leonard Colebrook!

Sir Leonard's ability to question all established methods and techniques in every discipline resulted in the creation of a unique epidemiological unit at the BAH to study the cause and prevention of burns. The results of the research conducted here eventually led to parliamentary legislation in Britain that made the installation of fireguards in all homes compulsory; it also led to the development of fire resistant

nightclothes for children. Making fireguards compulsory in homes required determined lobbying in the British Parliament, a task in which Colebrook was ably assisted by his wife Vera. It was worth the effort because this prosaic measure resulted in a major decrease in accidents from burns in the UK and did more for the control of burns than expensive and glamorous surgical and medical technologies.

Another important learning experience in this field was my six-month stint as house surgeon to A.B. Wallace in Edinburgh in 1954. It was important because it helped me develop a new approach, based on medical and sociological research, to the treatment of burns when I returned to India.

Wallace was known internationally for his Rule of Nine, a simple and elegant method for estimating the extent of burns. He was also known for the 'exposure' treatment of burns. As a plastic surgeon he had poor technique, but was nevertheless a remarkable observer and thinker with an inquisitive mind.

He once asked me about traditional treatment of burn injuries in India. I felt ashamed to tell him that the burnt area was covered with cow dung, since modern medicine had taught me the danger of contracting tetanus from such a dirty source. Wallace, however, explained that tetanus germ was an anaerobic organism and hence would not grow on the body surface. He added that we could learn from such old practices, which had evolved over thousands of years. If people still used them there must be something valid in them, he said.

He also explained why the doctor and especially the surgeon, who 'dressed' wounds to prevent infection, was actually creating the conditions of an incubation of germs—plasma, warmth, darkness and humidity. Observation teaches us that

the wounds of animals heal better because of constant licking without the help of any surgical dressing.

Burns represent the most formidable form of trauma. It has been associated with plastic surgery because the burnt area needs resurfacing with skin grafting. While Sir Harold Gillies had demonstrated this in the First World War, it was Archibald McIndoe who produced the most spectacular results during the Second World War with his treatment of burnt fighter pilots at his hospital in East Grinstead. And yet, as shown by John Bull in Birmingham, and later by our own epidemiological studies in Bombay, 80 per cent of all burn injuries are household accidents—even in an industrial city like Bombay—due to the traditional habit of cooking at the level of the floor. The loosely draped sari, drawn by convection current into the flame is generally the cause. Scalding of children playing on the kitchen floor is also common.

Somaiya, a social worker with our Department of Plastic Surgery at the J.J. Hospital conducted an epidemiological study of 3,000 burns cases in 1962. It became the basis of one of the earliest burns units in India and was dedicated solely to the treatment of burn injuries. The unit was set up on one of the floors of the plastic surgery department building.

I persuaded the Sir Dorabji Tata Trust to fund the air conditioning of the entire ward. Such luxury was rare in hospitals in those days and it brought considerable attention to the ward. With substantial grants from the American PL-480 funds, we also developed a thirty-bed ward for both treatment as well as research in microbiology, immunology and rehabilitation of the burnt patients, deformed because of contractures. Our postgraduate research laboratories carried out a lot of researches as well.

The American PL-480 funding enabled me as well as several members of our staff to visit the Shriners Burns Units in the

US and many others in the UK. It also provided expensive equipment like 'turning frames' and topical ointments like sulphamylon, which were flown in from the US. Thanks to these generous grants we could now employ a large number of nurses and ancillary staff in addition to those provided routinely by the J.J. Hospital.

All these smart additional facilities may have been expected to greatly help and enhance the treatment of patients. It certainly attracted considerable interest and helped start similar burns units in other parts of our country. But it also led to two radical changes in our own approach.

We discovered that the air conditioning, of which we were so proud, resulted in extensive cross-infection of patients by the recirculated air. It was hindering and not helping recovery! We dismantled the air-conditioned unit much to the annoyance of our donor. Fortunately, the old stone building in which the ward was housed had large windows on both sides which enabled excellent cross-ventilation, while the flies were kept out by extensive netting on the windows. Though annoyed, Professor Choksy of the Tata Trust, our donor, appreciated our reason for undoing their generous work and continued to support us in our other activities, though it was a sad blow to air-conditioning companies who were expecting lucrative business in the future!

It also dawned on us that the latest treatment and equipment for burns provided to us by the US government increased the cost of treating burns tenfold. If we continued with this method alone, we could certainly make our department a showpiece, but it would make the treatment of burns unavailable to most of our people.

Knowing my penchant for simplifying the complicated, the then director of health services of Maharashtra,

Dr V.N. Rao, asked me to establish a burns unit at the Thane Civil Hospital. Burns patients from the state's hinterland were to be filtered here before entering the island of Bombay. A small, isolated, dilapidated building consisting of one large room and a bathroom was offered to us. It had been vacated by the ophthalmic department, which had found it unsuitable as it was situated in a neglected part of the civil hospital compound.

Here, we were able to demonstrate that simple and cheap treatment could also be highly effective. The room was partitioned to form a male and a female ward and the nurses, ward boys and patients' relatives were trained in the simple but effective soap-and-water treatment that we had devised on an experimental basis at the J.J. Hospital. This treatment required the patients to wash themselves under a shower several times each day and then remain 'exposed' on their beds without any cover or dressing. Patients would be looked after and fed by their own relatives under the overall care and instructions of the nurse. If necessary, the patient, with the help of a relative, could wrap a bandage soaked in a simple bleaching powder solution around the burnt part after the shower. This made expensive antibiotics unnecessary and reduced expensive, time-consuming and painful dressings by nurses. The simple soap-and-water treatment also considerably reduced the need for skin grafting since exposure and continued washing reduces infection and avoids repeated dressings, which pull off the regenerating epithelium.

We taught nurses to estimate the extent of damage to the burnt area of the body by using the simple Rule of Nine formula, and a pinprick to measure its depth. Monitoring during the shock phase was done by observing the sophisticated devices provided by nature itself to every patient, namely,

urine output, thirst, restlessness and observing the colour of the ears. In most burns treatment centres these days, these highly sensitive and infallible indicators provided by nature have unfortunately been replaced by expensive laboratory tests once every day or even more frequently.

In both the J.J. Hospital and at the Thane Civil Hospital, patients with deep burns exceeding 50 per cent of the body surface were to be kept under sedation while an intravenous drip was installed to appease the relatives. I felt that vigorous resuscitation of such patients would only prolong their agony and they would invariably succumb from other causes such as infection. This is particularly so in the case of women who, having suffered homicidal burns, have lost the will to survive. An exception could be made in the case of a young, well-nourished individual who may have a reasonable chance and desire for survival.

Some 1,300 patients treated by this method at the Thane Civil Hospital under the supervision of Dr Swaran Arora, then a postgraduate student of our department, demonstrated that the mortality rate was the same as that in our more sophisticated unit at the J.J. Hospital. However, the morbidity and contractures were less at the Thane hospital, which also provided a psychological boost to the patient who was cared for by relatives rather than unknown hospital personnel. All these benefits came at a tenth of the cost of the far more sophisticated burns unit at the J.J. Hospital.

The dramatic results of this humane and highly cost-effective form of treatment have been published in national and international journals. Interestingly, the doctors of the Thane Civil Hospital, my senior colleagues at the J.J. Hospital, and plastic surgeons as a whole conspicuously refrained from using this simple method. In fact, it led to the resignation of some of my senior colleagues. I had sent them to visit burns

units in the US and the UK, where the cost of treatment was US\$5000 a day (as compared to a dollar a day in ours). On their return, they felt that our method was retrogressive.

This was not unlike the experience of Charles Fox, a general surgeon and an original thinker at the Columbia Hospital in New York, who was introduced to me by A.B. Wallace. I got to know Fox well during my visits to the US as also during his visits to India. Fox had developed silver sulphadiazine as a topical ointment for burns. This became a major product for the pharmaceutical industry. But when he tried to introduce zinc sulphadiazine as a much cheaper and more effective alternative, it was rejected by doctors as well as the pharmaceutical industry. I had stayed at Fox's home in New York where his wife Dulcy showed me how they had originally prepared this compound in their kitchen!

In 1971, the Burns Association of India was inaugurated in the Tata Department of Plastic Surgery (TDPS) with my old mentor, Douglas Jackson of the Birmingham Accident Hospital, as our chief guest. Sadly, it has now bifurcated into two rival associations.

The Tata Department of Plastic Surgery can claim to have played a pioneering role in the development of burns care in India in epidemiology, prevention, as well as in evolving a new, cheap, cost-effective and humane model for the treatment of burns based on sound scientific principles. This is gradually gaining acceptance among general and even plastic surgeons in both urban and rural hospitals of our country and possibly elsewhere. I was pleasantly surprised to find that this method was being used in West Bengal when I visited the state for a week at the behest of its government to help improve burns care in the medical college hospitals of Calcutta and the remote district of Bankura.

I must mention the important contribution of my senior associate, Dr Manohar Keswani, in promoting the prevention of burns on a large scale, and in using water as a first aid measure. His sustained efforts over the years in schools, at public meetings and through films to spread awareness about burns prevention, based on our department's early study of the cause of burns in the city of Bombay, needs greater acknowledgement. He did not accept the simple soap-and-water therapy but devised the potato peel dressing for burns.

The exposure of our staff to the more dramatic and expensive Western influence often made them reluctant to trust the simple, humane and cost-effective treatments devised by our own unit. I sometimes think it would have been more appropriate to send our staff to China, Vietnam and Thailand, countries that have made remarkable advances in burns as well as in other medical and surgical care under conditions that are comparable to and compatible with the requirements of a country like ours. A patient with 98 per cent burns was saved for the first time in Shanghai. The use of the banana leaf as a cheap and effective non-adherent dressing for burns was demonstrated by Dr Chongchet in Bangkok. I can bear personal witness to both these achievements. If elegance lies in simplifying the complicated, the West could profit greatly from our experience.

Quest for Knowledge

Research provides the understanding, as well as the tools, for solving problems. Fundamental research provides deep insight into natural phenomena and also ideas for philosophical reasoning. My early efforts to address problems purely through surgery led me in due course to question the underlying cause of these problems. Thus, the correction of deformities caused by leprosy led to the study of the underlying cause, namely immunological damage to the tissues and nerves. I then moved on to study the underlying social and economic problems as they concern the origins as well as the control of this and similar diseases.

I was initiated into biomedical research through my tryst with leprosy, a disease that expresses itself in almost two diametrically opposed forms—the infectious lepromatous form that is responsible for a majority of the facial deformities that we see in this disease, and the less infectious tuberculoid form that produces the deformities of the extremities.

As a surgeon, I had an almost unlimited opportunity to obtain biopsies of the tissues involved in this disease, not only of the skin but also of deeper tissues especially of the nerves whose damage was the major cause of the deformities of the hands and feet.

At the J.J. Hospital I had access to the services of an excellent neuropathology department, which was then headed by an outstanding neuropathologist and scientist, Dr Darab Dastur. This led to a fruitful cooperation and coordination between our departments for almost a decade. Dr Dastur would attend surgical operations to observe nerve damage *in vivo*, and I could observe and discuss the damage with him under the microscope *in vitro*. In fact, the microscope has always fascinated me because it reveals a world that we do not normally see. This experience attracted me to the field of biomedical research. It was evident to me from these studies that the damage to the nerves in leprosy was the result of bipolar immunological response.

The study that resulted from this collaboration not only provided a better understanding of the selective nature of nerve involvement in leprosy, but also of the cause of the differential sensory and motor loss that is peculiar to this disease—it involves the Schwann cell and hence affects the peripheral but not the central nervous system. As a result of this observation we were able to devise surgical operations to release the involved nerves at the site of their entrapment.

The most important contribution of this study was a better understanding of the Schwann cell, the primary host of *Mycobacterium leprae*. It modified the concept of leprosy from being a dermatological disease to a neurological one.

This approach has not only helped in the understanding of the cell with its unique association with *M. leprae*, but it has also proved to be useful in the understanding of the other peripheral neuropathies.

Preliminary laboratory studies in both leprosy and burns undertaken in the plastic surgery department and the postgraduate research building of the J.J. Hospital from 1962

to 1968 demonstrated that the pathology of both leprosy and burns is primarily moderated by the immune response of the host who succumbs to the insidious manipulation of the leprosy germ or to the massive physiological insult to the body in thermal injury.

This preliminary experience created in me a strong urge to understand the scientific basis of medicine, which had been almost entirely missing in my medical education in both India as well as in the UK. We doctors are chiefly technologists attempting to apply the knowledge provided by science. But quite often, we do not understand the basis of the science that underlies medicine, though that does not stop some of us from using highfalutin terminology to impress patients.

I did not want to switch over entirely from surgery to laboratory research since I was interested in surgery as well. But I believed that research would help me understand the biological and pathological aspects of surgery and eventually of diseases better. Above all, I wanted to see if a scientific approach could help improve the work of our department and stimulate a more scientific approach to medicine, especially among students.

Not many people understood my urge to do research, which was a far cry from surgery. Many doubted the sanity of such a radical decision. Also, I felt that it would help me get away from the routine of managing an already well-established department and it would help my colleagues to grow and take greater responsibility. It would demonstrate that the plastic surgery department that I had nurtured for over a decade could stand on its own feet.

Immunology was the logical choice as an area for my foray into medical science. It not only involved leprosy and burns, but also provided basic understanding of the interaction



Dr Noshir Antia with wife, Arnic, daughter, Avan, and son, Rustom



With Chottu at his residence in Pune in 2006



Old friends: Alan Mayhew, Wilfred Waldie and Noshir Antia in Scotland



Dr Antia with the Shahbano of Iran



The guru with his team at the Tata Department of Plastic Surgery



Examining a leprosy patient at Kondhwa

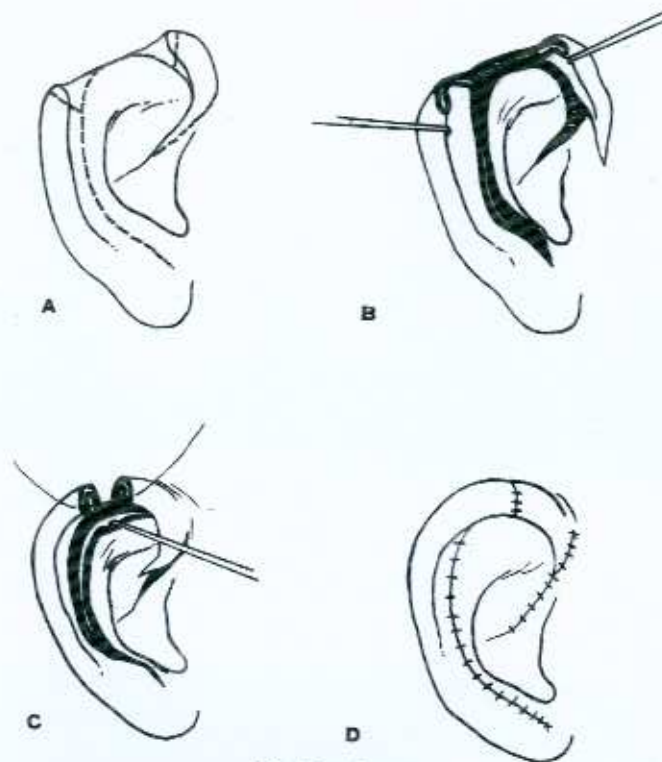
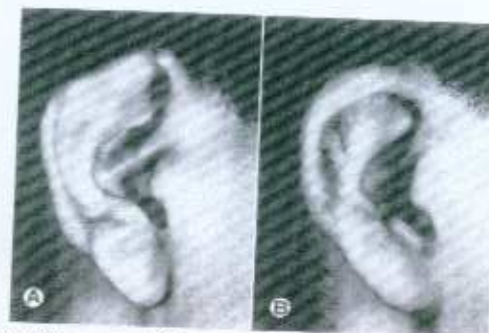


FIG. 4. Plan of operation



Procedure for repair of the ear, for which Dr Antia received the Fellowship of the American College of Surgeons



Joseph Murray and Noshir Antia at the investiture ceremony of the American College of Surgeons in 1979



Showing another world to a community health worker from Mandwa



At home with a tribal family at Pal, in the Satpuras



With the FMR staff during his last visit to the institution on 10 May 2007



Inaugurating the National Conference of Rural Surgeons of India



With his first research student at the FMR on 10 May 2007



Receiving the Padma Shri from President R. Venkatraman in 1990



President K.R. Narayanan presenting the G.D. Birla International Award for Humanism to Dr Antia in 1994

between the environment, the host and the bacteria. To explore the options, I visited the US and the UK to find out if I would be accepted by a well-established research institution that would provide me with sufficient finances to support my family whom I wanted with me. In the US, Dr Joseph Murray, a pioneer in kidney transplantation at the Harvard Medical School, who later received the Nobel Prize for his work, offered me a post that would enable me to undertake a combined study of the immunology of kidney transplantation in dogs in the laboratory, as well as partake in its clinical application in patients at the affiliated hospital. Murray was also a renowned plastic surgeon and a friend, who had stayed with us in Bombay. The job he offered me came with a fellowship of just US\$9,000 a year, which he himself told me would be insufficient to support me and my family.

As it turned out, this was a God-sent disappointment for, like Roy Calne of the Addenbroke Hospital in Cambridge in the UK, I too could have been tempted into pioneering organ transplantation in India, a glamorous but inappropriate exercise for our country.

I was more fortunate in Britain. Here, I was able to find work in the area of research I wanted, and received adequate financial support. Dr Richard Rees, who knew of my work in leprosy, had an entire research department devoted to leprosy in the famous National Institute for Medical Research (NIMR), the apex medical research institution in the UK. He introduced me to Sir Peter Medawar, the director of the institute, who had received the Nobel Prize for his original work in immunology. Medawar offered me a senior visiting fellowship worth £2,200 a year from the Wellcome Trust for undertaking immunological work in the field of leprosy for which his institution was already known throughout the world.

Before accepting, I discussed this seemingly hare-brained plan with my wife who would have to accompany me with our two children, aged seven and nine. She was aware that we would be leaving behind a well-established home and the security of my well-established private practice in plastic surgery, but she agreed without hesitation. It is the constant support of my family that has allowed me to fulfil many of my ambitions. I was entering an entirely new field and I would have to cut myself entirely away from all surgical practice, both hospital and private, for at least two years.

I was warned not to leave the plastic surgery department at the J.J. Hospital for such a long time while embarking on an entirely new speciality. I was also told that this would be fatal to my private practice, since I was then at the peak of my surgical career. My absence did create considerable disturbance in the plastic surgery department, but I was right in going because it enabled me to develop research at the J.J. Hospital on my return and, more importantly, led me to establish the Foundation for Medical Research (FMR), which is now an internationally acclaimed institution.

In 1968, my family and I left for London. The city offered a wealth of informative and entertaining places to visit. It was fascinating to go with my son Rustom to the Science Museum and study the instructive exhibits like the atom and the cell, and other areas of physics and biology that were of great interest to a school-going boy and his father. My daughter Avan spent days visiting the Natural History Museum with Arnie. Since she later studied marine biology and is now an oceanographer, I like to think this early exposure had something to do with her choice of career.

Today Rustom is assistant professor of biology at Emory University, Atlanta in the US, working on mathematical

modelling in infectious diseases, predicting the evolution of drug resistant bacteria and projecting the efficacy of vaccination strategies. A long jump indeed from physics to evolutionary biology, but one which has not lessened his love of climbing mountains, which he continues to do in the Himalayas each year. This is welcome as we get to see him quite frequently through these visits. This passion for climbing has been inherited by both his daughters, Alice and Roshan, who confound their male schoolmates with their expertise.

Our daughter Avan obtained her doctoral degree in marine biology from the University of Kiel. Since then she has found place in many prestigious expeditions including one to Antarctica and has even managed to attach the family name to a species of algae. She works at a research institute in the university, and is married and has two children, Maya and Carl. Besides her scientific interest in monitoring environmental disturbances in the oceans, Avan has been involved in enhancing education of the sciences in schools—an area in which I too share a deep interest. The genesis of this lies probably in the several Saturdays spent in Bombay in studying the sea water along the Worli shoreline next to our home.

At the NIMR, the five-feet bench space that was provided to me for my research was a big comedown from running a full-fledged unit occupying three large floors and a research block as I did in Bombay. The first request I received as soon as I started work was to obtain lepromatous skin from Bombay and graft it on the back of immuno-suppressed mice. I gently turned down this request because I was there to do research and study the overall functioning of a research institute, and not to become a glorified technician.

The leprosy research unit where senior scientists and technicians worked as a closely integrated team provided

the means for a hands-on study. Hierarchy, which plagues work culture in India, was absent both in the laboratory as well as in the dining room, lecture halls and seminars. Self-discipline and not imposed discipline, which we are more used to in our country, was evident despite the underlying class consciousness that exists in the UK.

I had an engaging discussion with Sir Peter Medawar on our first meeting after I joined. He told me that as a surgeon I might be tempted to treat experimental animals, but in the UK rules regarding animals were far stricter and humane than those regarding humans! He also insisted that I start working with my hands on any subject of my choice and not spend the first six months only reading textbooks on research. This was a wise bit of advice.

Medawar insisted that I work two days a week on his own research in a small laboratory like everyone else. Direction not administration was his interest. Everyone took pride in the simplicity and elegance with which they solved problems using the simplest, cheapest, and often self-assembled, instruments. At meetings, scientific merit and not personal acrimony was responsible for the decision taken. The excellence of the research was based on the easy availability and sharing of expertise at all levels in a variety of fields. The main building of the institute was more than a hundred years old and I worked in the attic of a hut that Sir Edward Mellanby, the Nobel laureate and the discoverer of vitamin D, had used as his bedroom.

Things were very different when I visited Dr Weddell, the professor of anatomy at Oxford, to see slides of his work on leprosy. I never got to see any slides since Weddell was one of those people who are reluctant to part with their knowledge, but he always gave me an excellent lunch in his room!

At the Charing Cross Hospital, where I also worked, I wanted to learn the simple technique of lymphocyte stimulation. The immunologist there told me, somewhat pompously, that I would have to send him my best PhD student for nine months to learn this technique. On my return to India, I asked one of my PhD students, Saroj Khanolkar, to learn the technique from a standard publication. She demonstrated excellent results within two weeks!

Our two years' stay in the UK was satisfying, both in the professional as well as in the social sphere. The children went to a local school which was free. We lived in a new, furnished flat that was lent to us by a Professor Feldberg. He had bought it with the money he had received as compensation for the house he had left behind in Berlin when he fled the city and Hitler in 1938. We had to keep a careful eye on our expenses but even so I had no hesitation in refusing the offer of a part-time assistantship in the fashionable Harley Street with my former chief in plastic surgery, Patrick Clarkson.

We returned to Bombay in 1970. Research was now a high priority with me. I had to get some space to carry out research work, and the postgraduate research laboratory building at the J.J. Hospital was ideal for the purpose. But most of the rooms still remained locked. I did the same thing that I had done when I needed rooms for the leprosy rehabilitation work. I cut the locks and occupied several empty rooms. The PL-480 funds came in handy here, and provided a modicum of equipment, but getting suitable staff was a problem.

Vanaja Shetty, a junior researcher in the burns unit, and a BSc graduate, was my first scientific assistant. Today, she is deputy director of the Foundation for Medical Research (FMR) that I started in 1975. Fortunately, I received university approval as a guide for MSc students working in applied

biology. Serendipity provided three young girls who had passed their BSc in microbiology and wanted a guide for their MSc research. I wanted students to fulfil my university and research requirements, so it was a mutually convenient deal. But more than that, it has proved to be remarkably successful, for two of the young students, Nerges Mistry and Tannaz Birdi, stayed on to work with me. Both are senior colleagues today and well-known researchers in their chosen fields and have a well-deserved international reputation.

Since I was unable to spare much time for the plastic surgery department, my private practice and research, most of my students, whether in plastic surgery or in research, were forced, to a great extent, to develop their talents on their own, with a little guidance and modest facilities provided by me. Didactic teaching was not my forte, nor did I have the time or inclination for it. My classroom at the Foundation for Medical Research comprised a few students sitting around a microscope peering at the wonders of nature as reflected in a germ or a human tissue, and then linking it to larger issues of philosophy and evolution. Many students have crossed over to other disciplines and now participate in entirely different fields like rural surgery, sociology, rural health and even the Panchayati Raj programme. This reveals the enormous potential of almost all human beings who can bloom if they are encouraged and not suppressed in a hierarchical system of education and work. Apprenticeship rather than formal education enabled my students to develop their talents as in our guru–shishya tradition.

Our research in leprosy received a huge boost when Professor E.J. Ambrose, a cell biologist and cancer researcher of international repute, who had served as adviser to the Tata Memorial Hospital and Bhabha Atomic Research Centre (BARC) for over ten years, offered us his expertise in the field

of leprosy. His support and guidance in the early stages of our leprosy research gave us confidence and provided direction to our research besides initiating the students in the methods of research at a higher level.

It was unfortunate that my earlier collaboration with my colleague, Dr Darab Dastur, the neuropathologist, received a setback on my return. Many pathologists and researchers are reluctant to share knowledge and information with clinicians who they believe should not encroach on what they consider their territory.

Research in the clinical laboratory of the burns unit got a fillip with the new inputs in immunology, but the major emphasis shifted to leprosy. An animal house was established to test the viability and drug sensitivity of the leprosy germ with the only available means—the mouse foot pad. On hindsight, I believe that torturing animals for the welfare of humans is hardly justifiable. Science is insensitive to the harm it does to animals for selfish motives, and is also doing something similar to the human species with the undertaking of several unethical clinical trials in our part of the world.

The issue of using animals for research reminds me of my first meeting with Sorab Hakim, one of the most interesting and original minds in biomedical research.

Hakim was, as his name suggests, born into a family of well-known Parsi hakims of Bombay. Instead of practising Unani medicine, he chose to study Western medicine after he received his PhD from Oxford University. His acute mind could not be contained in any formal medical research institution. It is to the credit of the Wellcome Trust that they chose to support his research, which he conducted in his home on the fifth floor of a magnificent, centuries-old building in the heart of Bombay, where his hakim ancestors had practised their art.

When I visited his research laboratory in this traditional Parsi home I saw several monkeys seated on small stools around a large table, all smoking cigarettes, which I later discovered were laced with opium! Hakim's laboratory assistant was his old mother who was dressed in a sari draped in the Parsi style and with her hair bound in the traditional white headscarf or *mathabanu*.

Hakim was at the time carrying out research on oesophageal cancer. During visits he made to Iran, he had observed that the province of Gilan on the southern shore of the Caspian Sea had a high incidence of oesophageal cancer; the adjacent province of Mazenderan was virtually free from this disease. He concluded that the difference was due to the fact that opium was grown on farms in Gilan, and was eaten, not smoked, by the populace. This led him to the study of the epidemiology of various types of cancer based on the mode of the intake. For example, nasopharyngeal cancer occurs due to reverse smoking (putting the lighted end in the mouth), which is a common practice in some countries of South-east Asia.

In the 1960s, Dr Hakim had fought the giant multinational Unilever Corporation single-handedly and had succeeded in proving that the company added argemoney oil to sunflower oil in one of its products in order to increase profits. Argemoney oil is cheaper but harmful. The case landed up in court where Hakim demonstrated a simple but highly effective method of detecting the presence of argemoney oil. He sprayed the marketed oil onto ordinary blotting paper and subjected it to fluorescent light. Argemoney fluoresces when exposed to such light. He gave me a demonstration of this in his makeshift laboratory. Apart from his work, he also spoke to me about his visit to Iran. He described how each year on Navroze (21 March), the celebrations of the new year in Iran,

the pillars of the ancient royal city of Persepolis are aligned with the sun.

Unfortunately, Hakim died at a young age—an example of how many a flower blooms unrecognized. I believe there is no dearth of talent among our people. We will discover this only if we move out of the universities and scientific institutions that have lost much of their ingenuity by aping the West.

To return to my own work in research, the main thrust of research at the J.J. Hospital complex was the study of nerve damage in leprosy. We utilized the fortuitous amalgamation of surgery, pathology, immunology and microbiology. The ability to obtain funicular biopsies of nerves, including the index branch of the radial nerve, without causing damage to the patient, proved to be of significant help as did the careful sensory testing before such biopsy.

All our researchers were encouraged to participate in the clinical observation of the patient, which was followed by observing nerve exploration in the operating theatre, collecting the biopsy and observing it under the microscope. This provided researchers a unique opportunity seldom available to a scientist restricted to his laboratory or a surgeon to his knife.

Since the major area of immunology research at the time was the lymphocyte, one of my young students in the mid-1970s posed a pertinent question: why was the macrophage (a phagocytic cell in human blood and tissues) teeming with engulfed leprosy organisms especially in the lepromatous (a more severe) form of this disease? Perceiving that this was an area not worked on sufficiently, the student, Tannaz Birdi, wanted this to be the subject for her MSc research. Even though it was an unusual request, I felt that she should be allowed to pursue this subject and it eventually became the subject of her PhD thesis. Her original

contribution to the field of leprosy research has not received due recognition or acclaim. It needs further attention and research as it can contribute much to the understanding of immunology and the treatment of various other chronic diseases in the tropics.

My interest in biomedical research led to the formation of the Foundation for Medical Research (FMR) in 1975. Dr Kanti Sheth, a philanthropic surgeon belonging to an affluent business community of Bombay had died at an early age and his family, which was associated with the Great Eastern Shipping Company, desired that his hospital in Worli be utilized to serve the needs of the poor.

They approached me, along with the Godrejs, and offered me this hospital. They probably thought that as a surgeon I would convert it into a hospital for the needy. I got them to visit the plastic surgery department and research laboratory at the J.J. Hospital and suggested that it would be far more useful if they allowed me to use the building as a laboratory for leprosy research. To my astonishment, they agreed, and the Foundation for Medical Research was born on the understanding that the two families would provide seed money for the institution till we could make it self-supporting by obtaining research grants.

The problem once again was to attract researchers for a small, new private institute with limited resources and equipment and that too in the field of leprosy where they would have to work with patients and live leprosy bacilli. Even the National Institutes of Health in the USA prohibited such work, demonstrating the unscientific fear of this disease, not only among doctors, but also among scientists. I would often caution scientists at the FMR to have more respect for the leprosy germ. Though they were careful, they were quite

casual about the possible danger of working with both live leprosy germs, which are only weakly transmissible, and also drug resistant tuberculosis germs and HIV-infected specimens. They worked on the latter in an upgraded P-2 biological facility set up through project grants. This facility paid special attention to workers' safety. Our researchers were trained to believe that working with live pathogens is an accepted occupational hazard.

Fortunately, we were able to staff the FMR with student researchers from the laboratory at the J.J. Hospital, who already had experience of leprosy research. We were doubly fortunate that in 1974 Professor Ambrose took early retirement from the Chester Beatty Institute in London and decided to come to India in 1975 and work at the FMR where we provided him and his wife with a small flat in the building at Worli. He turned down a very lucrative offer from a cancer research centre in Buffalo, in the US, to work with us. For him, concern for the ailing poor took priority over personal comfort. The two years he spent at the FMR, guiding and training the staff and students at an important stage in the growth of this institution, were crucial. We will be eternally grateful to him and his family for their help.

Trained in the traditional concept of research in the UK during the war, Ambrose took pride in modifying equipment and facilities to produce high-quality research. His expertise in cell biology is described in a book he wrote in which he also mentions his visit to our rural project in Alibaug. Ambrose also helped us with an important bit of research. Since a major obstacle to the development of a new drug for leprosy was the inability to grow *M. leprae* in culture, Ambrose demonstrated its viability by radio-labelling the organism with a known metabolite, L-Dopa, using his contacts

with the atomic energy establishment in Bombay to obtain it. This extremely original experimental work was published in the prestigious journal *Nature*.

During one of our visits to the UK in later years, Arnie and I visited his home, a four-hundred-year-old cottage near Hastings. He continued to do leprosy research at the National Institute of Medical Research, Mill Hill, in London, for many years.

The book *The Peripheral Nerve in Leprosy and Other Neuropathies* that I co-edited with my former student and now colleague, Dr Vanaja Shetty, describes in detail several areas where we carried out original research and our findings. Of these, the study of the Schwann cell, both in vivo and in vitro, and achieving the multiplication of *M. leprae* in tissue-cultured peripheral nerve needs to be mentioned, particularly the latter, since the organism, like most germs, is not cultivable in artificial media. It was a difficult type of culture that Professor Ambrose had learnt at University College London and then taught us. The human and experimental studies on early nerve damage in mice have provided a new dimension to peripheral nerve injuries in leprosy and other demyelinating diseases. They also indicate that the problems of loss of sensation and continuing nerve damage as well as rehabilitation will continue to engage the control programme for at least another two decades even after leprosy has been eliminated.

During this period, the FMR collaborated for five years with the Institute of Neurology in London, which also included an exchange programme. It was supported by the British Council. Our joint studies (which included working with the electron microscope)—a unique series that is now acknowledged as a classic—with Dr David Landon of the

Institute of Neurology demonstrated a common origin and sequence of nerve damage in different forms of leprosy.

The FMR has studied leprosy through different approaches, which always started with the patient whose interest remains our guiding star. Despite some rumbling to the contrary from our administrator—that there would be objections to bringing leprosy patients to an elite residential area like Worli Seaface in Bombay, where the FMR was situated—I insisted that no research would be complete if our staff did not see and interact with actual patients. The research could not be separated from the patients for whom it was undertaken. As at the J.J. Hospital, the fears were unfounded and no one raised any objections.

Soon, the FMR became a full-fledged research institute with permanent recognition from the University of Bombay to train postgraduate research students. Members of our staff visit national and international institutions and attend congresses where they present their work. Some of them have received national awards in appreciation of their work. There was also a reverse flow of scientists coming from all over the world to the FMR, and a stimulating exchange of ideas and researches took place. It was a lively atmosphere with inter-group exchanges and debates amongst students and staff, many of whom worked on opposing sides of the fence! A notable example was the issue of developing vaccines for leprosy. One group actually worked on developing a sub-unit vaccine whereas the other critiqued the entire approach through their own experimentation. Both contributed to the field and concurrently learnt the art of accepting and giving critique graciously. That this private institution could, in a short period, obtain and ultimately survive on research grants from national and international sources, like the prestigious

Wellcome Trust, speaks volumes of the dedication of its staff and students. No doubt, it has had its ups and downs, but good work commands attention and respect. The dynamism of the institution is revealed in how it has moved from leprosy to tuberculosis and then to waterborne diseases—the three major problems in our country.

I perhaps was the goad in persuading Nerges Mistry and Tannaz Birdi to divert from leprosy and develop a long-term viable research programme in multi-drug-resistant tuberculosis and medicinal plants in the early 1990s. A young post-doctoral researcher from Oxford, Douglas Young, who started his meteoric rise in biomedical research at the FMR in the early 1980s, is now our main collaborator for research on tuberculosis. He is the head of a dynamic research team at Imperial College, London. The tuberculosis programme has contributed much to the understanding and measurement of the emergence and transmission of drug resistance in our country and highlighted important operational difficulties in the national tuberculosis (TB) programme. Our research on medicinal plants has revealed vital common approaches of testing medicinal plants in the laboratory. I nudged them to work on a wider canvas. As scientists they were trained to go deep into the subject. A good piece of research is largely a question of how you manage to give and take. Work at the FMR encompasses both science and social issues and I suspect that my indoctrination over the years has had something to do with it.

In 1975, the Foundation for Medical Research (FMR) and the Foundation for Research in Community Health (FRCH) were registered as independent trusts. Though independent institutions, the FMR and the FRCH have worked in tandem and have functioned as almost a single organization—a rarity

among research institutions. The best example is our work on integrated rural drinking water management in the FRCH project area in Purandhar block, about fifty kilometres from Pune. This is a drought-prone area. The FMR contributed an ingenious electrical wire, a copper coil that disinfected contaminated water and was simple enough to be used by school children. We were able to bring together human resources with innovative technology and highlight a crucial approach to public health in underserved areas. Enthused by the success of this project, the school children have become responsible and contributing members of their community.

This participatory method is unique to these two institutions. Fieldwork and laboratory research are generally unrelated or function as distant partners. The identification of problems and attempts at their solution must always be a continuous, single process.

These small private institutions are efficient and cost-effective because there is no hierarchy or bureaucracy. Decisions are taken and implemented without interference from the trustees or government. This has allowed the FRCH and the FMR to criticize and to direct health policy and, to a certain extent, guide national programmes. I hope that the government and the Indian Council of Medical Research with whom I have interacted closely over the years will provide similar latitude and support to both these institutions which now have far greater funding.

The Foundation for Medical Research has shown that excellence in research is possible without spending vulgar sums of money. It shows that people who have confidence, motivation and purpose work better than those with extravagant academic degrees. The constant pinch of limited funds also keeps the scientists alert and thinking. They actively

contribute to make ends meet, though I wish that there was a less exhausting middle path!

The challenge before the FMR is to retain and expand its human resources in the face of westward migration of researchers and the proliferation of large government-funded research institutions, clinical research institutes and pharmaceutical companies. But wherever they go, I hope that the many scientists trained at the FMR will undertake their work with integrity and vision and not be pressurized by commercial or unethical considerations that are rampant today. I recall that when the Indo-US vaccine programme was thrust on India in the 1980s without an epidemiological basis, the FMR opposed it. The US consul general paid a visit to the FMR to try and persuade us to withdraw our opposition. When that did not work, the PL-480 funds to the FMR were withdrawn.

Scientists often feel the urge to follow the fashion of the decade. Today, it is the decade of sophistry in genomics and proteomics. We had a young student at the FMR who was working on basic microbiological techniques for checking the quality of rural water sources. He abandoned this vital area of work and went off to join his family business because he was constantly being ridiculed by his friends for indulging in research that involved little use of technology.

The researches at the FMR are recorded in its formidable list of publications. The stability and continuity of this institution owes a great deal to the three women who have been working here since its inception—Nerges Mistry, Tannaz Birdi and Vanaja Shetty. All three have achieved international stature at a relatively young age and work closely to provide a strong foundation for the future. Dr Nerges Mistry, who has many outstanding and varied abilities, is the joint director of the FMR and the FRCH.

There have been many changes in the way scientific research is funded. There is more money today, but the expectations are greater and there is more competition. Funding for scientific research in India was almost negligible three decades ago because of the low value placed on it and despite large tax exemptions offered by the government. The current emphasis on research is largely linked to commercially profitable biotechnology ventures, patenting and similar activities. The unglamorous field of research in public health issues, which I think will be the 'fashion' of the next decade, is where both the FMR and the FRCH have already done pioneering work by asking the appropriate questions and not being afraid to move between the lab and the land. This work needs to be made better known through a conscious effort since scientific researchers are the worst disseminators of even their own work.

The FMR has made its mark as a small private lab-oriented research institute in the midst of heavily funded government institutes. It is constantly evolving programmes to keep pace with the country's needs. It has managed to stay afloat and healthy for three decades. All these achievements are rare and I am enormously proud of them.

First Steps in Community Health

Despite our excellent work at the J.J. Hospital, I realized that we were hardly touching the fringe of the problem of medical care in Bombay. A vast majority of our people live in small towns and rural areas. Many patients who sought medical care in both public and even private hospitals, had to travel long distances with their relatives from various parts of the state or the country, often for problems which could have been treated in their own communities if they had ready access to simple medical and surgical facilities.

Many problems, like *cancrum oris* (a deformity caused by malnutrition) with its ghastly deformities, were the result of poverty and malnutrition. Poverty, then, needed to be addressed to prevent the prolonged and expensive treatments and surgeries. As our experience with burns had shown, prevention is better than cure. However, certain cures like washing the burns with soap and water can be used in rural hospitals. Helplessness and fear accompany the patients who have to venture into unknown cities and bear the enormous cost of transport and accommodation for their relatives apart from the cost of their own treatment. Many had to live on the footpaths surrounding the hospital. This was ignored by

specialists who concentrated on diseases than on patients and their problems.

Perhaps my childhood memories of Hubli, where I saw the abject poverty of the people at close quarters, made me more sensitive to this aspect of medical care. It was brought to my attention most forcibly when, in 1972, I made several weekend visits to villages in the North Alibaug taluka, across the Bombay harbour, as the guest of the industrialist Naval Godrej who had a weekend home there.

The harbour separated the most affluent part of the metropolis with its proud skyscrapers from extreme poverty. This was the case even after three decades of independence.

The government-run primary health centre was some distance away and not easily accessible. Also, it was hardly functional. To relieve their pain and suffering, the poor flocked to the government district hospital in Alibaug, where a remarkably efficient and overworked young lady, Dr Paranjpe, tended to all medical and even surgical problems with remarkable diligence. This put me—a specialist in a premier medical college—to shame. It also demonstrated how much a single motivated and conscientious doctor could achieve, not for money, but out of love. And, yet, this district hospital of 150 beds could serve the needs of only a fraction of this Alibaug community.

There were also nine private doctors in the area who were trained in indigenous systems of medicine, but were pumping dangerous doses of antibiotics, analgesics, corticosteroids and anti-histamines into patients. They were living off people who had no access to any alternative form of care.

My regular weekend visits to this community in North Alibaug taluka convinced me that the underlying cause of

most diseases is poverty. Yet, not knowing how to tackle this fell disease, I felt impelled to offer some form of medical care to those who, despite an annual rainfall of 100 inches, had to scoop water from almost dried up ponds for three months of the year.

My response was to train people from within the community in simple, preventive health care and provide equally simple oral medicines for them to prescribe. As a plastic surgeon whose knowledge of general health care was only skin deep, I could not, fortunately, confuse the trainees with incomprehensible medical jargon.

The village of Mandwa became the centre of our activities and I went there on most weekends. Thirty village women, one each from the thirty surrounding villages, whose education level varied between the fourth and the tenth standard would gather under a tree or on the veranda of a school or temple, to get their training. Women were chosen because I thought they would be better at this work, because it involved little use of technology, because it required affinity with the people, and because women are more sincere.

I was fortunate to have the support of the industrialist, the late Naval Godrej, who had a weekend cottage in Mandwa. This unusual individual would actually sit in on our training sessions in the hot afternoons and also provided financial support, which included the building of a small training centre and hospital.

Our first training session at Mandwa was conducted in May 1973 in a school that was shut for the summer vacation. We invited senior professors from the Grant Medical College to teach anatomy, physiology and basic medicine to our selected group of women volunteers. This was not the best method because the doctors confused the trainees with an overload of

information. It was a young doctor from a background similar to that of our trainees who proved to be the most efficient trainer. He earned the love and respect of the community because he attended to their medical problems at all times.

Within a year, we had managed to recruit social workers from a well-known social science institute in Bombay, and also a young scheduled caste doctor from the J.J. Hospital. But soon, we realized that highly qualified urban staff could not live and work in rural conditions. A fisherman's son qualified in Ayurveda, accepted by one and all in his community, more than made up for his deficiency in medical knowledge and proved to be a better choice.

Within five years, the trained village health workers achieved in the late 1970s, almost two-thirds of the health targets that the government, with its expensive infrastructure, hoped to achieve by AD 2000 (according to the World Health Organization norms). This was not only in the area of minor health problems, but also for major diseases like malaria, tuberculosis, waterborne diseases and even family planning, and all at a remarkably low cost.

This experience was an eye-opener for it taught us not only the difference between education and intelligence—our women health workers were not very educated, but were very intelligent—it also proved that achieving good health is more a social than a medical, techno-managerial function. We drew upon different systems of health and medical care. These were simple but highly effective in preventive, promotive and curative medicine and could be used by the semi-literate local village women, provided the knowledge was imparted to them in simple language and its application demonstrated.

Once they gained in confidence, the village health workers demonstrated a remarkable ability to use simple knowledge,

technology and medicines to solve many major problems. The old fear of leprosy soon disappeared and those afflicted by leprosy, driven out of their villages, were accepted back. The health workers immunized children. Knowing the index case, they could suspect new cases of tuberculosis in the early stages. Once the doctor confirmed their diagnosis, the village health worker ensured regular treatment by personally going to the house of the patient and administering streptomycin injections. The acceptance of family planning also improved.

Similar schemes were in operation at this time in Jamkhed, Miraj and Kasa, which were run by voluntary agencies. The then health minister of Maharashtra, K.M. Patil, and the chief secretary, J.B. D'Souza, together with Dr Sushila Nayar, former Central minister of health, visited Mandwa to see our scheme in operation. The visit was memorable for one incident: one of our health workers upbraided the minister for not ensuring that food received priority over medicine!

In 1978, based on the experiences of several community health projects in the country, including Mandwa, the government introduced the Community Health Workers' Scheme as a national programme. Over 1,00,000 workers, 92 per cent of whom were men, were recruited and paid an honorarium of fifty rupees every month, and given two weeks' training at the local primary health centre.

The scheme was doomed to fail. It relied heavily on males who looked on the honorarium as pocket money. To add to this, the workers were not given continuous training through discussions, demonstrations and monitoring. Above all, these health volunteers (later rechristened health guides) were accountable to the government, not to the villagers, and the government was interested primarily in securing its health targets. The scheme failed to realize that primary

health care must lie in the hands of the people themselves, not with the government. It was obvious that this was one of those political gimmicks used by all political parties to earn cheap popularity with their vote banks, and as such it was incapable of serving the purpose of improving health conditions in rural areas.

While Naval Godrej provided financial support for Mandwa, the Bhiwandiwalla Trust provided support for the extension of the project to Uran taluka with its more difficult terrain. Here, village workers had been immunizing children on their own following an epidemic of gastroenteritis because they believed, falsely, that all diarrhoeas are a result of cholera. Though this was not the correct treatment, it did show that village workers could undertake work that is traditionally seen as being in the domain of the medical profession, such as immunization. This quickly spread to Mandwa.

Our experiment in Mandwa had a positive effect on the health of the community, but it had an unexpected fallout. It demonstrated how the provision of simple knowledge and information to local village women could pose a threat to the local leadership and disturb the traditional status quo of the political system. We were initially welcomed with the hope that we would provide medical services which the village leaders and power brokers could use to enhance their stature. But when the women we had trained, who were now better informed, began demanding their rights, they became a threat to these leaders. As we began working more with the people, bypassing their leaders, the latter became openly hostile. Ultimately, this opposition and hostility from the entrenched power brokers caused us to withdraw from the project in 1983.

The closure of the Mandwa project was considered a failure by several of our well-wishers. What it really demonstrated,

though, was that an insecure political system can be threatened by the mere activation of local village women.

One consequence of the Mandwa project was the establishment of a small cell in the plastic surgery department of the J.J. Hospital for the study of the social and economic factors involved in rural health care. This grew into the Foundation for Research into Community Health (FRCH) which provided the research for the secretariat of the joint panel of ICSSR and ICMR that produced the path breaking 1981 public health report *Health for All: An Alternative Strategy* (more about this in a later chapter).

For me, Mandwa pointed to a new direction. It was to become the focus of my activities in the years to come. Having been bitten by the rural health care bug, as it were, we followed up the Mandwa project with another one at Malshiras in the drought-prone Purandhar taluka of Pune district.

Two senior researchers from FRCH undertook a five-year research study funded by the Indian Council for Medical Research (ICMR) to ascertain the impact of health education. FRCH provided education to the staff of the Primary Health Centre (PHC) and combined this with direct health education to the people served by the same PHC.

The research showed that the government staff showed little interest. But the information provided directly to the community, often in late-night meetings, was well accepted. However, without the medical support of the village health workers as in Mandwa, and without the help of the PHC, the people had to resort to the private sector for expensive and often poor quality curative services.

For the staff involved in the Malshiras project it was a unique experience. It gave insights into the conditions of rural India. Based on their experiences here some of those

involved in the project later established their own voluntary organizations undertaking interesting activities in various allied fields like small savings schemes, political mobilization of the community as well as theoretical research in areas of their interest. This project also revealed the problems and limitations of the government's rural health services, from which one hoped that some corrective action might result.

The experiences of Mandwa and Malshiras led to further explorations of the people-based approach to health and medical care. Much of the experience we gained here was distilled in the *Health for All* report in which the FRCH was involved.

Health for All

The poor health care system for people in rural areas of our country is one of the greatest failings of independent India. It is not as if there was no blueprint available to show us the way. One of the most remarkable documents compiled on effective health care, particularly for rural areas, was the report of the joint panel of the ICSSR and the ICMR, *Health for All: An Alternative Strategy*, which helped formulate India's health policy in 1983, but has never been implemented. I was involved in the preparation of this report and in the process met one of its guiding lights, and a man who has left a deep impression on me, J.P. Naik.

In 1977, I was invited by the ICSSR to make a presentation at a meeting held at the National Institute of Nutrition in Hyderabad. Since our preliminary experience in Mandwa indicated the feasibility of a new, socially oriented, people-based, 'bottom-up' approach to both medical and health care, instead of the traditional hierarchical, over-medicalized approach, I submitted a paper based on the Mandwa experience.

This was my first experience of a national research institute. Just before the presentation, I met a short, elderly person in

the corridor who informed me that he would be unable to attend my presentation but had read my paper, which he said 'struck a common chord'. Little did I realize that this brief encounter would lead to a long and intimate association with J.P. Naik, the eminent educationist and founder of the Indian Institute of Education in Pune, who had influenced the National Education Policy. This towering yet simple, affable and self-effacing person straddled both the social and the political scenes like Mahatma Gandhi. He was, at that time, the director of the ICSSR, and this was his first venture into the field of medicine. JP, as we affectionately referred to him, was not familiar with the role played by the medical profession in the health scenario of the country. So he asked me to organize a meeting of leaders of the medical profession. The meeting was held at the Kalina campus of the University of Bombay and it resulted in the establishment of the joint panel of the ICSSR and ICMR to review the health situation in the country thirty years after independence. Its brief was to suggest ways of improving the existing system and, if necessary, provide an alternative.

V. Ramalingaswamy, the director general of the ICMR and the director of the All India Institute of Medical Sciences, was nominated as the chairperson of the committee, and I was appointed member secretary. On the committee were not only prominent members of the medical profession but also experts from other fields such as social scientists, economists and anthropologists, besides, of course, J.P. Naik who represented the ICSSR. Though an educationist, he showed great interest in the social aspects of medicine.

The Foundation for Research in Community Health (FRCH) was appointed the secretariat for this major undertaking. This gave the FRCH the opportunity to take a giant leap from its

small project in Mandwa and involve itself with health care at the national level. While working on the report from 1978 to 1981, I met many well-known and respected personalities not only in health, but also in various other disciplines like education, sociology and economics. At the same time, I gained some insight into the nuances of institutions and politics in Delhi. It was very useful to make this in-depth study of medicine and its social dimensions while building the research cell of the FRCH in Bombay. I was now able to grasp many concepts of health and illness, and was thus able to build a multidisciplinary team of researchers who gave a new dimension to the FRCH's future activities.

The ICSSR-ICMR panel started by commissioning eighteen background papers from various authorities. The suggestions, consolidated from these papers, were to be the basis for our future work. At the very first meeting, many of us—experts in medicine—were taken aback when Naik asked us what we knew about health. 'Can we expect to have health given the abject poverty of the villages and of the urban slums?' he asked. 'We are only experts at treating the failures of health, and have converted health into illness, and illness into a new, lucrative business and industry,' he continued. This was an unusual but honest appraisal of the medical profession.

With his uncanny vision, JP directed the discussion away from medical technology to the social, cultural, economic and political determinants of both health and medical care. He spoke of the role of the people and especially of women, who bear the brunt of the problems of health and care of children. This provided a new dimension to our discussions and was an eye-opener to the participating doctors and scientists. JP never cast doubts on the importance of the role of the medical profession, but encouraged us, in the same

breath, to pay attention to the various social problems that ultimately determine the health of the people. He also urged us to ensure the proper utilization of available medical services by including all systems of medicine, as well as age-old health concepts and practices of our people.

Dr K.N. Udupa, who has played a pioneering role in the integration of all systems of medicine and health care at the highest level of practice and research, provided useful inputs about Ayurveda and yoga, which integrate the mental as well as physical aspects of health and disease better than other forms. Years later, I visited him in Varanasi, when he was director of the Institute of Medical Sciences at the Banaras Hindu University. He took me to see his rural health project just outside the city. After his death, the FRCH commissioned Shipra Banerjee to write a book on him which was published in 1999, and titled *Against All Odds: Story of a Modern Surshruta*.

The FRCH acted as rapporteur of these interesting discussions where conflicting views were often expressed, and presented an overall analysis of the proceedings.

JP also asked me to provide details of how a people's health programme could be implemented based on the FRCH experience in Mandwa and similar experiences elsewhere, and also share my experiences of secondary and tertiary care hospitals in the UK, and Pune and Bombay.

The gist of my findings was that about 80 per cent of both health as well as medical care can be undertaken within the village community by suitably trained and equipped semi-literate village women, and that a further 10 per cent of cases can be handled at a community hospital at the taluka level, leaving only a few highly complicated problems for the district or the city hospital. We estimated that this would

cost about eighty rupees per capita per annum at the then prevailing price.

These findings were incorporated in the report and I knew that they would be anathema to some of my medical colleagues, so I informed JP at the start of the session, before I presented my findings, that if the panel refused to accept them, I would have to tender my resignation. As expected, the medical professionals present did raise several objections. But before I could reply, Naik informed the panellists that 'this is not negotiable.' It was a measure of the high regard in which he was held that all the members of the panel accepted his ruling without a murmur. I believe that even today my cost estimate holds true after making the necessary correction for inflation over the past twenty-five years, that is, at Rs 500 per capita per annum.

I came to know J.P. Naik in the last five years of his life, but he has left a lasting impression on me. We both had the same aim in our different fields of endeavour. He wanted to take basic education to the underprivileged at the grass-roots level, and I wanted to do the same for health. Our personal experiences in our respective fields made us believe, quite sincerely, that what we proposed to do was feasible. The only obstruction to reaching sound education and health care to the masses was the mindset of those who had vested interests in perpetuating the existing unequal order, such as the so-called educationists, doctors, bureaucrats and politicians.

JP questioned the existing set-up and had tried to modify the system from within as the member secretary of the ICSSR for almost two decades. He worked from a small rented room in the Indian Institute of Public Administration in Delhi, which served as both the headquarters of a vibrant ICSSR, and also as his residence. I vividly remember him bent over

an old wooden table surrounded by stacks of files whenever I went to visit him early in the morning. He would go into a small kitchen and make buttermilk for the two of us. To my mind he was a model of elegance, and combined simplicity with efficiency. He could well have chosen to work from a large, well-appointed office in a government department or large institute, pandered to by armies of chaprasis, clerks and secretaries—'joint', 'under' and 'deputy'—but that was not his way. I have seen many such large offices with their attached bathrooms, since the common one was always filthy. I find it surreal that even half a century after independence those paid to serve the basic needs of their billion fellow countrymen choose to replicate the manners and style of the British Raj.

JP was cast in a different mould. The classic reports of the Kothari Commission on Education that he produced reflect the thoughts of this self-effacing genius who had a remarkably lucid pen. He was a Gandhian who succeeded in infiltrating the country's seat of power more effectively than the pseudo-Gandhians of modern-day Wardha. The future of our country lies in cloning such stalwarts who seek to release the minds of our people from the mental and material shackles that still remain the legacy of the Raj.

Arnie and I visited his 'lantern' schools in the villages near Pune, where the poorest girls and boys of the village would come late in the evening with hurricane lanterns, slates and books. He believed that it was the youngsters and not the universities that represented the future of our country.

It was under J.P. Naik's guidance that the medical profession learnt to differentiate health from medicine. The ICSSR-ICMR report, which was entirely his creation, spelt out the Health for All policy. In his inimitable, lucid style, he defined the

factors that determine the health of the people—education, gender equality, nutrition and, ultimately, the political system that decides the type as well as the delivery of both health as well as medical services.

JP was preoccupied with many assignments he had on hand and was unable to publish the joint panel report till the Sixth Five Year Plan was about to be submitted. Then, in order not to miss the opportunity of getting the planners to read some of our findings, he sat in Professor Ramalingaswamy's office and wrote this remarkable report in a simple yet vivid style in just two weeks. It was then printed by the economist on our panel, Dr Narottam Shah, of the Centre for Monitoring the Indian Economy (CMIE), and submitted to a special committee appointed by the Parliament, which accepted it almost verbatim.

The ICSSR-ICMR report *Health for All: An Alternative Strategy* outlined a new approach to health as well as medical care for our country. The chief participants in this new approach were the individual, the family, and the local community. There was no medical service to be 'delivered' to them by a distant public sector health bureaucracy, or by the private sector, or by any charity. Even the hospital services up to the basic speciality level would be under the administrative and financial control of the local community (the panchayat).

This approach is in keeping with our country's traditional understanding and practice of health and illness care. The individual, the family and the local community must be allowed to take responsibility for their own overall development and welfare, concerning both mind and body, helped by their local healer as and when required. Life, suffering and death are part of a natural process, and cannot

be cured by medicines. Life processes are supported by a healthy lifestyle—one that addresses the needs of both the mind and the body. This approach is diametrically opposed to the Cartesian biomechanical understanding of life that our bodies are to be maintained and repaired like machines. Thirty years ago, the political and social thinker Ivan Illich, in his prophetic understanding of both education and health had predicted that ultimately body image and food fads would also be converted into a marketable commodity like medicine. This has now come true.

The report sought to harmonize the concepts of life, health and medical care, using the most relevant aspects of all systems of health and medical care. The alternative model it suggests—democratic, decentralized, participatory and economical—seeks to integrate preventive and curative functions and to combine the best Indian tradition and practices with modern science.

The 'bottom-up' approach to health enunciated in the *Health for All* report was demonstrated on a countrywide scale in China through its barefoot doctor scheme. The rural health programme of the FRCH continues to demonstrate the potential of this approach for widespread application.

Though the report was presented to, and accepted by, a special committee of the Parliament, and broadly incorporated in the health policy, its prescriptions were never implemented because of the absence of necessary political will. J.P. Naik's prescriptions for education and health thus gathered dust, while the prescriptions of the World Health Organization and the World Bank were eagerly adopted.

Any other person may have been discouraged by the lukewarm response to his sensible initiatives. But JP did not show a semblance of despondency. He was convinced

that you cannot fool all the people all the time and that theoretical models needed to be evolved, and their feasibility demonstrated on a small scale, so that when the time was ripe they could be implemented on a countrywide basis. On his deathbed he wished me 'good luck' with a blink of his eyes.

Now, twenty-five years after it was formulated, the main findings of this report have been incorporated in the National Health Policy of 2000 and in the National Rural Health Mission of the present United Progressive Alliance government as part of primary health care. It is obvious by now that the 'top-to-bottom' approach to medicine has failed to serve the needs of the majority of our people. The method of grass-roots health care enunciated in this report does not provide second-class health and medical care to the poor. In fact, it is appropriate for the rich, the middle class and the poor.

Village Women Show the Way

Mandwa and Malshiras were valuable first-hand lessons that convinced me that we needed to continue our efforts to improve health care services for poor rural communities. It was also clear that the women of the community had to play a major role. The greatest difficulty in implementing any health programme or policy for our vast rural areas is getting qualified personnel to live and work there. It is unlikely that doctors and nurses trained in the city will settle down in remote villages with minimum facilities and infrastructure. It is thus common sense to train the community to look after its basic health needs.

Throughout the late 1980s and early 1990s the FRCH had learnt a lot about the different aspects of the public and private health systems, drug supplies, the motivation and functioning of auxiliary nurses and midwives, health education, and health financing. Studies by our researchers in these areas, quoted even today, were supported by government and international bilateral funding agencies. The number and interests of the latter unfortunately dwindled in the mid-1990s as multinational donors such as the World Bank began to monopolize the scene.

Another development in the early 1990s—the era of capitalist expansion—was, paradoxically, the ushering in of the seventy-third and the seventy-fourth amendments to the Constitution. These amendments decentralized political power, which devolved to the panchayats and villages. This was the political opportunity that J.P. Naik had advised me to look out for before attempting to implement a people-based system of health care.

With our growing experience in public health care, and the opportunity that opened up with Panchayati Raj, we were well-equipped to begin an expanded community health project in 1995. The area we selected was in the taluka of Purandhar, where Malshiras too was situated. It was, in fact a control area for the Malshiras project. The FRCH had conducted a baseline study of socio-economic conditions and demography of Parinche, and it was here that we started interacting with the village in the 1990s. I would travel frequently from Bombay to Parinche, where I had a small room. In 2002, Arnie and I relocated to Pune, which was just sixty kilometres from Parinche.

Though close to Pune, this area of 200 square kilometres with a population of around 26,000 is secluded from the urban influence of the city. It is located in a valley surrounded by mountains that rise to a height of 5,000 feet. While the upper half of the valley is hilly terrain suitable only for cattle rearing, the lower and the relatively more prosperous half is engaged in market gardening and was known for figs and other fruits until drought conditions prevailed. The largest village in the area, with a population of about 3,000, was Parinche, and hence lent its name to the project. An adjacent village called Veer was later included in the project.

We first approached the people with an offer to help improve the health of their children. But, strangely, they wanted us to first look after the health of their cattle! Their reasoning was simple: if the cow died, so did the children—from malnutrition. Their response reflected the unfortunate condition of people living only sixty kilometres away from an affluent city. The milk, fruit, and vegetables they produce are sold in Pune city where half the profits are skimmed off by middlemen. Despite an annual rainfall of almost 100 inches, many villages are drought prone, while a dam in the lower part of the valley provides water to distant sugar factories owned by powerful politicians. Parinche is fairly representative of the condition of western Maharashtra. However, its proximity to a big city ensures a better level of education and greater opportunities of employment for the menfolk.

We first established contact with the community through songs and street plays led by Ramesh Awasthi and Manisha Gupte. A micro-savings group was started next along the lines of Bangladesh's famous Grameen Bank by one of our trustees, Ramesh Awasthi. More than 1,000 women are now its members.

Within a few months about forty women from twenty-four villages showed an interest in being trained as health workers. We selected them on the basis of motivation, and family and community support than on the level of education. A majority of them were therefore semi-literate. They were predominantly from the Maratha caste. We provided them a modest honorarium and paid the cost of transport for attending the training sessions. FRCH rented rooms in the village and soon established a base there, recruiting several members of its staff both male and female from the village itself.

Many women trainees walked up to twelve kilometres to attend the training sessions that were held thrice a week. The training was held in different villages to achieve visibility and many a session had peripheral onlookers like mothers-in-law, husbands, old men and children who listened in—initially with much scepticism and amusement at the thought that their wives or mothers or sisters could do the work of doctors.

Classes were held outdoors—under beautiful tamarind trees, in ornately decorated temple courtyards or on school verandahs. The first phase of training was geared towards building confidence in the women, some of whom had not stepped out of the boundaries of their village homes for the past twenty years. Body imagery and mapping was a very powerful way of breaking the expected culture of silence.

Participatory training has now become a mantra in development circles. The FRCH training team, led by Seema Deodhar, a young nurse, devised integrated training material for almost all the topics. For example, a programme on water-borne diseases would include sharing individual experiences woven into themes on the politics of water, its conservation, the water cycle and so on. Hands-on experience in the field was allowed after three months, at which point the women were supplied with a kit for emergency medical care and twenty essential allopathic as well as Ayurvedic drugs.

The scepticism in the community started receding as the health workers whom we called 'tais' (elder sisters) started making their presence felt. The tais confessed to us later that they would go and see the patients at least thrice at their homes after giving them a prescription, just to make sure they had got it right! Gradually, fellow villagers began consulting them for minor and moderate medical problems for themselves. As their confidence in the tais increased, they

were asked to treat their children as well. The tais charged a nominal amount for their services and the medicines.

In time, they were able to mobilize their communities for common actions such as cleaning wells and drainage pipes and speaking up at public meetings, demanding services from their local governing bodies, the gram panchayats. They also saved family money by treating domestic animals for basic illnesses.

Their confidence increased and, with time, they were able to travel on their own and talk to women from other villages. Community contact was maintained by the workers largely through two activities: through wall posters and newspapers, and conducting khelwadis (play groups) and 'eco groups' (environmental education) with children.

Within a year the tais were able to handle about 60 per cent of the health problems of their communities. The public health service was used in just 4 per cent of cases. The khelwadis provided not only enjoyable evening games but also a forum to discuss nutrition, hygiene and healthy lifestyles. Scientists from our sister organization, the Foundation for Medical Research, taught school children how to test if the local water was potable, and methods to purify water at the source and the household level. They also learnt to recognize and use locally available medicinal plants for common conditions and collected information on sanitation-related practices of the community.

Thus a base for public health and preventive approaches was established in the community along with curative care. But the strongest way of engendering community contact was the cultural programmes and entertainment that the tais arranged through field staff and schoolchildren which could draw contributions of up to Rs 3,000 for each event!

Building a community process like this one was not without its problems. The *tais* were often accused of nepotism, arrogance and of breaking the traditions of the community. Being very much a part of the community, they were also susceptible to class and caste prejudices prevalent in their communities. These had to be gently but firmly broken during the trainings. Even today, the *tais* are reluctant to be overseen by village health committees, which they perceive to be oppressive or unfair. At times community feeling was subservient to individual or family advancement and there have been instances when someone tried to supplement her income in a not-so-ethical manner. Transparency is, therefore, emphasized whether it is in the form of issue of receipts for payments made by the community, or in giving feedback to the community.

A variety of activities were started based on the needs and demands of the villagers. Proper records were kept of both successes and failures. The training was conducted both in the field as well as at the centre we had set up in Parinche.

The training was more in the form of discussions of actual problems rather than didactic teaching. There were no qualified doctors on the training team. The single-minded curative approach of most doctors did not fit in with what the project was trying to achieve and many a motivated but out-of-place medic had to be axed to preserve the socio-technical mix of the project. Their virtual absence in the earlier phase of the training did much to enhance the confidence of the *tais* in handling clinical problems. This is not to deny the role of qualified medicos in structured referrals.

A small pathological laboratory and patient examination facilities were added that provided an out-patient service. The base at Parinche was also equipped with a computer-

based algorithmic diagnostic programme, capable of making fairly accurate diagnoses. The telecommunication equipment has been used both as a training tool, and, much more, for broadcasting news and issues to the entire valley. In fact, it links together villages that have greater access to big cities than to one another. When the Commonwealth Education Media Centre in Delhi heard of this programme they offered to train the *tais* and others in the village in the basics of audio-visual communication.

Every week refresher training sessions are held. Clinical records maintained by the *tais* are examined, and their weekly assignments and activities discussed. Health workers of the three large clusters in the valley get together every month at Parinche to maintain contact, discuss their experiences and plan out activities for the next month.

It has been eleven years since we first engaged with the people of Parinche. The first batch of forty *tais* paved the way for successive batches. The most recent batch, in 2005, was drawn from the hilly region of Kaldheri. The women here are illiterate, but they themselves identified and persuaded relatively more educated women to join the training programme. Poverty, lack of education, and social class nevertheless marginalize women, even at Parinche. We see an overall attrition rate of 35 per cent among the trainees and it is predominantly women from the Dalit and the backward classes who drop out. These women are often unable to devote time for this work, which could compromise their daily struggle for wages and the family's survival.

In 1999, four years after we started the Parinche project, it was time to upgrade some of the more competent *tais* to the second level, the *sahyogini* (one who facilitates). With the help of funds from the Sir Dorabji Tata Trust, whose

senior officers had visited Parinche, we devised a course which upgraded the clinical skills of the women health workers and strengthened their social and logistic skills (such as negotiations, communication, monitoring, simple bookkeeping). We took the women to facilities in Pune so that they could get hands-on clinical training for cases in deliveries, orthopaedics, and dentistry.

It was during this time that I met Professor Ambasht, the director of the National Institute of Open Schooling (NIOS) in New Delhi. It was a most fruitful meeting. Ambasht lost no time in accrediting the two courses (tai and sahyogini) to the NIOS. He also saw the value of reducing the minimal qualification for entry to the fourth grade (basic reading and writing skills). This made a vast segment of rural women, who were deprived of school education at the middle level, eligible for the course.

Though the course did not grant legal status to our health workers, I saw it as an approach to achieve standardization of content as well as assurance of competency through the internal and external evaluations that the women would have to undergo. This accreditation served to catalyse the efforts for dissemination of the Parinche model to different parts of the country.

In 1998, an accomplished Pune-based development filmmaker, Urmila Mohite, made a film on the Parinche project. The documentary, *Hidden Fires*, was viewed by A.R. Nanda, then secretary to the ministry of health and family welfare, which led to a most fortuitous meeting with Dr David Potter, the medical adviser to the European Commission. In the Parinche model he saw a way to address the various health problems plaguing this country. His synergy with Mr Nanda and the financial support pledged through the

European Commission overrode several blocks at the ministry to establish a Resource and Training Centre at Parinche in 2002.

This simple but adequately equipped centre has hosted over 600 trainees from different parts of Maharashtra, Gujarat, Orissa, West Bengal, Jharkhand and Karnataka in either orientation or training courses for health workers and their master trainers. District-level training teams from various states under the National Rural Health Mission (NRHM) are now expected to undergo orientation here in the philosophy of the ICSSR-ICMR report *Health for All* of which Parinche has become a living embodiment.

Experimentation has accompanied me at every stage of my life. I cannot be satisfied with my accomplishments, because like life itself they too are living entities. I am now convinced that the key to any system building starts with awakening the minds of the people whom we deal with. I see that the recent political reforms culminating in the Right to Information as a most significant development in the delivery of equity and constitutional justice of which health care is but one aspect. The attempt to introduce this to health workers throughout the country is one of my recent activities with the NIOS and I look forward to its fruits.

When I reminisce about the beginnings of our work in Parinche, I am often reminded of a question I voiced there in the early years after an irritating dispute between two of my colleagues: 'How the hell are we going to achieve anything in this God-forsaken place!'

I hope that what you have read in the previous pages is ample response to my question.

The National Rural Health Mission

I am often asked if the community-based health care approach adopted in Parinche can be replicated in a vast country, with varying conditions, like ours. My response has always been that a single demonstration can only provide inspiration and operational guidelines for others to take forward and tailor them to their specific locales and problems. The Jamkhed model of comprehensive primary health care, devised by Rajnikant and Mabelle Arole has influenced community-based programmes not only in our own country but in many countries in Asia and Africa. Abhay and Rani Bang's Gadchiroli model has been vigorously adopted for its simple but highly effective innovations in neonatal care and treatment of childhood pneumonia. Mortality rates were reduced by over 50 per cent through timely diagnosis and administration of gentamycin injection by trained tribal health workers for respiratory ailments. Other experiences from Africa and Bangladesh have shown the ability of paramedical workers to even perform surgical procedures such as caesarean sections and vasectomies.

The Parinche model, however, differs from these approaches. It is not just a medical model. The Parinche model looks at

health care as an objective where medical care is but one issue. The broadest concept of health has been applied at Parinche, which encompasses all aspects of rural development and rural needs.

The tals of Parinche may be less skilled than those who have been formally trained in health care, but their ability to conceptualize and articulate demands, to mobilize and inspire their communities into collective action in health and other issues is, in my opinion, vastly superior.

We have emphasized comprehensive rural development in all our dissemination efforts with private organizations and the government. In 2001, the dynamic chief minister of Madhya Pradesh, Digvijay Singh, discussed many aspects of rural health care with me over breakfast at his residence in Bhopal. He wanted us to devise a system in Rajgarh block, which was his political constituency.

He visited Parinche in July 2001 to see first-hand what we were doing there and the visit generated much excitement among the villagers. All the roads in Parinche were cleaned up, a helipad was constructed at the base of a hillock and there was the inevitable presence of both human and canine security. When the latter were brought to sniff out anything undesirable in the bags of the assembled tals, many ladies fainted in terror and trepidation!

The chief minister landed five hours behind schedule but more than made up for this lapse by spending three hours with the health workers and our staff, asking probing and pertinent questions.

The project in Rajgarh, however, never took off. The chief secretary of the state, Mr Gopalakrishnan, in a hurry to implement decentralized health care in the state, chose the Jan Swasthya Rakshak Scheme. Under this scheme, young

rural men and women are trained within six months in basic curative care. Hastily contrived and poorly implemented, it took precedence over the Parinche model.

I have had many experiences of this kind of bureaucratic impatience to implement programmes without any real understanding of how they will work on the ground. In September 2004, my colleague Nerges Mistry and I attended a meeting in Delhi chaired by Jayaprakash Narayan, a member of the high-powered National Advisory Committee of the United Progressive Alliance government. The National Rural Health Mission (NRHM), one of the biggest social sector programmes of the UPA government, was being formulated. We also came to know that the Accredited Social Health Activist (ASHA) was at the centre of the programme.

After the meeting, Nerges and I were told to meet the health secretary, P.K. Hota, in his office. To our astonishment, Hota requested that our organization, the FRCH, provide a blueprint to train 3,00,000 community health workers in six months! When he saw our obvious consternation, he assured us that it was possible—all we had to do was just ‘get some more people’!

While the creation of the ASHA is a vindication of the collective NGO experiences of the last thirty years, many of us in the voluntary sector were apprehensive that the errors of the Community Health Volunteer/Guide Scheme of the 1970s and the 1980s were about to be repeated. That scheme had been doomed from the start by poor selection, male bias, poor training and lack of referral and motivational support.

In October 2006, the NRHM and its key features were revealed. It set off waves of concern in the voluntary sector. The features most criticized were the domination of family planning and population control; a hidden agenda for

privatization of health care; anomalies and haste in the selection and training of the ASHA volunteers; and the lack of both referral and motivational support from the crumbling public health system.

At my request a coordinating group of NGOs was formed. One of its first tasks was to transmit the concerns of our sector to the highest levels of the government. A request was made that the voluntary sector be consulted in the planning and execution of the NRHM. We wrote a letter to the prime minister’s office (PMO). Soon after, I sought a personal appointment with Prime Minister Manmohan Singh, whom I was acquainted with, when he was the governor of the Reserve Bank of India in Bombay.

After meeting me in his office, the prime minister graciously invited me to his home. I was carrying my bible—the ICSSR–ICMR Report *Health for All*—which I recommended to him. He smiled gently and informed me that he had already read it from ‘cover to cover’.

He strongly felt that the NRHM should be undertaken as a people’s movement. I promptly took out a recent publication of mine, *Health and Medical Care: A People’s Movement*, and presented it to him.

We were all delighted when a few days later, an e-mail from the PMO, from none other than my old friend Gopalakrishnan, assured us that the prime minister was of the opinion that the NRHM should be strongly mentored by NGOs. Shortly after, Sayeeda Hameed, head of the health sector of the Planning Commission, came to see a recently opened rural project of the FRCH in Ralegan Siddhi in Maharashtra. Her thoughts on our approach to community health, penned in a letter to the Planning Commission chief Montek Singh Ahluwalia, captured the essence of our efforts in empowerment of rural women.

This political commitment resulted in a strong and able representation of NGOs in the mission's Steering, Mentoring and Community Action Advisory committees, the last of which co-opted the Coordinating Group of NGOs. Since I was on all three committees, in addition to the specific task forces set up before the launch of the mission, I often had to listen to Arnie, wondering tongue-in-cheek, why we did not set up another home in New Delhi.

The FRCH was invited to actively participate with the ministry of health and the National Institute of Health and Family Welfare in modifying the training modules for the ASHA along with CHETNA, Shyam Ashtekar, Abhay Bang and others. These cumulative efforts not only resulted in significant improvement in the quality of these documents but also rationalized training schedules and provided a niche for continuing the education of the health workers. Mentoring of the mission by an NGO also brought about substantial funding at the sub-district level and enhanced the role of local governance bodies like the panchayats in the screening and monitoring of the ASHA.

As is the case with all government schemes, political expediency and bureaucratic mindsets managed to influence policy. The training programme for the ASHA in the final policy is still too short a duration—a mere twenty-three days—to produce a health functionary out of a woman with a little education. The non-functional medical officer and the ANM are to monitor the work of the ASHA. Many units of the public health system are sceptical of the concept of the ASHA and reluctant to support it.

A prime concern, voiced even by the prime minister, is the lack of appropriate trainers for the ASHA. It was the FRCH that introduced the idea of joint training of master

trainers from both the public and NGO sectors so that a cohesive training programme taking bisectoral interests into account could be implemented. While this was still being considered, the health ministry deputed district-level trainers from three empowerment action guarantee (EAG) states to attend a fortnight-long orientation at the Resource and Training Centre at Parinche. This came about through the persuasive efforts of S. Jalaja, the director of the NRHM who had visited Parinche.

The sceptical and demanding attitude of the government's district trainers was in sharp contrast to the disciplined, motivated and highly analytical participation of trainers from grass-roots organizations such as the Holy Cross Order of Karnataka, the Rajasthan and Uttar Pradesh chapters of the Catholic Health Association of India (RUPCHA) and the Tata Steel Rural Development Society (TSRDS), Jamshedpur, whose members had long served in extremely vulnerable and remote areas. Their combination of technical skills with belief in the ability and destiny of the people in their care was admirable.

This experience gave the FRCH food for thought. The emphasis was now on how to structure similar sessions for the future. It also gave us an insight into the minds and attitudes of public sector personnel. It reinforced our suspicion that the real challenge to the success of the NRHM lies in changing the attitudes and motivation levels of the public sector, and not just in tackling managerial, technical or financial issues.

The Parinche model also appealed to the former governor of Rajasthan, Pratibha Patil. She first heard of it in unusual circumstances. She was presiding over a meeting of the Association of Plastic Surgeons of India in Jaipur in 2004 where I delivered a rather perverse keynote address. Rather

than extolling the marvels of modern plastic surgery, as I am sure my audience expected, I spoke enthusiastically about the potential of Panchayati Raj, decentralization and the catalytic role of women health workers in transforming the dismal health scenario.

Patil told me later that at first she thought I was senile, but after I had more detailed discussions with her, she confessed to being 'half convinced'. After visiting Parinche in 2005, and interacting with the tais, however, she declared that she was fully convinced!

It was fortunate that during this visit she was accompanied by Shiv Chandra Mathur, the director of the Institute of Health and Family Welfare, Jaipur. He has translated her vision into a project based on the Parinche model in five public health centre (PHC) areas in Rajasthan where a viable partnership has been forged between government and NGOs.

A mixed team of community health worker trainees and NGO representatives from Rajasthan underwent five days of orientation at Parinche in September 2006. They learnt mainly through field demonstrations rather than classroom lectures, which they said they preferred. Seema Deodhar, a senior trainer at the FRCH, guided the trainers and NGOs at the State Institute of Health and Family Welfare (SIHFW) in Jaipur. Mathur hopes that SIHFW can eventually serve as an accredited vocational institute of the National Institute of Open Schooling (NIOS).

Since 2005, we are also trying to identify organizations in various parts of the country that can be regional training centres affiliated to the NIOS. The process of testing towards accreditation has already begun. Nevertheless, it is my belief that the best trainers will eventually be the rural women themselves, armed with the best mix of social, cultural and medical expertise.

Development of these trainers at the grass roots has been an ongoing activity at Parinche for some time now, though the progress seems to be average. Unexpectedly, it was the tribal women from Chandrapur in eastern Maharashtra, initially trained by the FRCH training team at their home base through the Ambuja Foundation, who have already started teaching women like themselves in the backward areas of rural Rajasthan.

Even though the role of the ASHA is currently diluted in the NRHM, I see it as a new, empowered member of a quality-based cadre of health workers who will work successfully for their communities in contrast to the system that has exploited and manipulated them hitherto.

I see no reason why the ASHAs cannot ascend to advanced levels of learning to bring these village women at par with the old licentiate of the British Raj and enable them to undertake most of the problems of health and medical care in their local areas. This would be a quantum advance in the reforms intended for medical education.

A sure way to judge the success of the NRHM, and indeed all our endeavours, will be the demand from the grass roots. The recently introduced Right to Information Act will provide teeth to efforts to secure equitable, accessible and effective health care.

The late J.P. Naik had cautioned me against starting community-based health programmes in the 1980s saying that the time was not right. I am happy that those of us who have struggled since the 1970s have seen their efforts vindicated in the NRHM, however imperfect it might be.

Building Institutions

In the course of my work I have had some interesting experiences founding professional associations and societies to promote work in various areas of medicine. Not all experiences have been happy ones, but they taught me a great deal.

The 3R Society (for Reconstructive Surgery, Rehabilitation and Research) was the first of these. Others that followed were the National Association of Equal Opportunities for the Handicapped (NASEOH), the Burns Association of India, Indian Society for Surgery of the Hand, and the Association of Rural Surgeons of India. I was also a founder member of the Association of Plastic Surgeons of India. The Foundation for Medical Research (FMR) and the Foundation for Research in Community Health (FRCH), both established in 1975, are two institutions with which I am still closely involved.

These institutions helped propagate and expand the work that we had pioneered in various parts of the country. Membership of some of the societies such as the 3R Society, NASEOH and the Burns Association were open to the public; the others restricted membership to those who were interested and actively involved in the work of these societies. All these

institutions were registered under the Societies Registration Act. It is a pleasure to see how most of them have grown to become major institutions of our country, despite the inevitable trials and tribulations that occurred in the early phases.

I wanted these areas in medicine to expand and serve a wider section of our society and, thus, cater to the needs of the common people in a cost-effective manner and appropriate to their needs.

I was literally forced to form the first of these institutions, the 3R Society, in order to channel the PL-480 funds that were provided to the Tata Department of Plastic Surgery (TDPS) at the J.J. Hospital, and later, the grants from the Tata trusts for starting the burns unit. Donors prefer to support an organization that is registered as a public trust. I did not know the difference between a society and a trust at that time. Therefore, these institutions were kept open to anyone who chose to become a member. The institutions we established later were in the form of public trusts with a closed managing committee of not more than seven trustees, who had to abide by the charity commissioner's requirements. The FMR and the FRCH are hence trusts.

As I did not wish to be officially at the helm of any of these organizations because of other demands on my time and energy, I invariably handed over this responsibility to others. Thus, the well-known cricketer and industrialist Vijay Merchant, who we thought would be able to attract funds, was made the chairman of the 3R Society and NASEOH, while another industrialist was appointed the vice-president. Dr M.H. Keswani, my senior assistant, oversaw the day-to-day work as secretary, while I remained an active member.

As I have mentioned earlier, the largest support in starting our research activities for leprosy and burns was provided by

the American PL-480 funds, though, for a while, the open societies functioned satisfactorily and managed to obtain substantial grants from public donations. I had managed to attract American funding following a meeting in 1959 with Joseph M. La Rocca, who represented the United States department of health, education and welfare. La Rocca later became a personal friend. I met La Rocca at Karigiri, at the first leprosy surgery and rehabilitation meet, which was sponsored by his department.

In due course, additional PL-480 funds were provided for rehabilitation of patients who suffered deformities that resulted from burns and leprosy. We developed original plastic footwear and other orthotic devices for leprosy and burns patients. This led to the formation of the National Association of Equal Opportunities for the Handicapped (NASEOH), which was headed by the same individuals who were the chairpersons of the 3R Society. Ganeshan, a young business management consultant, and I were in a hurry to expand the rehabilitation activities of Bombay by integrating our project activities with other categories of the handicapped such as the blind and mentally handicapped.

Immediately after establishing NASEOH in 1968, I went abroad for two years to further my interest in the field of medical research. When I returned, I found that the affairs of both the 3R Society and NASEOH had been hijacked by those who wanted to control the considerable funds that had accumulated. Disappointed at this turn of affairs, I resigned from both the 3R Society and NASEOH. This experience taught me a lesson: that people with famous names often love to hold posts in social institutions to gain kudos, but do little work in return. I also realized that, barring a select few, most businessmen and industrialists enter the field of

social work not to render selfless service, but as an act of charity, which helps enhance the image of their businesses and themselves. They consider such donations as charity and not as a means to help the needy to stand on their own feet. To me, charity is demeaning to both, the giver as well as the recipient. Large foreign trusts, such as the Wellcome, Ford and Rockefeller trusts, have overcome this tendency by ensuring that their trusts operate in isolation from the parent funding institution and are run by professionals who believe in encouraging self-sufficiency, not charity. This also ensures there is no personal influence or bias of the donors. Other than the house of the Tatas, I know of no other institution in India whose trust is divorced from the industry that financially supports it. I hope this approach will expand in our country.

Though my early experiences in setting up organizations were not very happy, I went on to establish several others. The Burns Association of India was inaugurated in the Tata Department of Plastic Surgery in 1971 by Douglas Jackson under whom I had worked at the internationally recognized Burns Unit of the Birmingham Accident Hospital in Britain. I had not yet learnt from my earlier experiences, and I once again invited Vijay Merchant to be president and my assistant Dr Keswani, now known for his 'potato peel' dressing of burns, to be secretary. This society also had the same problems and I eventually had to dissociate myself from it.

The Indian Association for Surgery of the Hand was also inaugurated in our plastic surgery department at the J.J. Hospital in January 1974 by Guy Pulvertaft, the renowned hand surgeon from the UK. It is one of the major institutions for hand surgery in our country today. I was invited to give the keynote address at its annual meeting in Bangalore in 2004.

Both the Burns Association and the Indian Association for the Surgery of the Hand are today major national institutions and are the outcome of our pioneering work in these areas in the department of plastic surgery at the J.J. Hospital. I declined to serve as president or secretary to these organizations. These institutions have grown under their own steam and have professionals from all over the country as members. Unfortunately, a second, independent Burns Association was started later in Delhi.

I was also a founder member of the plastic surgery section of the Association of Surgeons of India (ASI). There were just five plastic surgeons in the country in 1959—Balakrishnan from Nagpur, Robin Sinha from Patna, Murari Mukherjee from Calcutta, R. N. Sharma from Lucknow, and myself. All of us were trained in England. Sir Harold Gillies, the founder of modern plastic surgery, was present at the annual meeting of the Association of Surgeons of India (ASI) held in Nagpur in 1959. It was he who suggested that an Association of Plastic Surgeons be established in India.

Hence, the Association of Plastic Surgeons of India (APSI) started as a section of the Association of Surgeons of India (ASI) and came into existence with R.N. Cooper, the doyen of Indian surgery, as president, and myself as secretary—a post I held for six years. It is now a major independent national institution in its own right; no longer a section of the ASI.

In September 1983, I was elected president of the ninth International Congress of Plastic Surgery. The congress was held in Delhi and was attended by 1,600 plastic surgeons from all over the world. It was a unique experience. I visited China, Japan and the Philippines, to invite plastic surgeons of these countries to the congress.

I was also instrumental in establishing the Association of Rural Surgeons of India (ARSI) since the Association of

Surgeons of India (ASI) refused to acknowledge rural surgery as a section of ASI, even though several well-qualified general surgeons of the ASI were providing surgical care to the rural poor by adapting surgery to suit the entirely different socio-economic conditions of rural India.

The Association of Rural Surgeons of India was started with just seven doctors. R.D. Prabhu of Shimoga and J.K. Banerjee of Rural Medical Care Centre, Delhi, were its two most vocal advocates. The first conference was held in Wardha in 1993. Dr Balu Sankaran was the first president and the Gandhian, Sushila Nayar, was our patron. Zafrulla Chowdhury, whose work in rural health care in Bangladesh is well known, was a welcome guest. The second meeting of ARSI was held in Delhi when I was president. ARSI has now matured into a well-recognized independent body with over 350 members from all over India and its membership includes not just surgeons but medical persons from allied fields such as anaesthesia.

Also, ARSI has initiated a distance education course in rural surgery under the aegis of the Indira Gandhi National Open University (IGNOU), thanks to the efforts of Dr J.K. Banerjee. ARSI now seeks to extend this training to doctors with an MBBS degree to provide basic surgical and medical care for the 70 per cent of the population that still lives in rural areas in a country called Bharat.

The Antia-Finseth award was instituted by the ARSI in the year 2000 for innovations in rural surgery. Dr Frederick Finseth was referred by Dr John Constable, the head of the Plastic Surgery Department of the Massachusetts Hospital in the US, to work and study in our department at the J.J. Hospital immediately after qualifying as a plastic surgeon at the Harvard Medical School. Since then, he has come

almost every year to India and undertakes leprosy surgery in Orissa. We hope that this award, which we jointly instituted, will provide recognition to rural surgeons and encourage them to innovate under difficult conditions in which they perform have to work.

The first Antia-Finseth award went to an anaesthetist from Ahmednagar who devised an ingenious portable ventilator for the lungs. This compact and portable low-priced instrument can be operated on electricity, on batteries, and manually, all at one-third the cost of the far more cumbersome ones sold by instrument companies. Another award winner demonstrated the use of a plastic mosquito net for hernia repair that cost 35 paise as against the Rs 4,000 for the mesh marketed by a multinational pharmaceutical company in India.

We hope that ARSI will help us overcome the tendency to imitate procedures that require expensive technology such as laparoscopy, which has been excessively promoted by its manufacturer, Stortz. The first laparoscope was donated to a professor of surgery at the J.J. Hospital.

ARSI also interacts with the National Human Rights Commission on issues such as unbanked, direct blood transfusion in rural areas, which is vital for undertaking emergency and surgical procedure where laboratory and blood bank facilities are not available. Through these efforts, the creation of rural blood depots was mooted. The extent to which this has helped the underserved segment of rural India is immeasurable.

The two institutions with which I am at present chiefly involved and where I feel I have been able to make a worthwhile contribution, are the Foundation for Medical Research (FMR) and the Foundation for Research in Community Health (FRCH). Both were officially registered by

the charity commissioner's office in 1975 after my return from the National Institute for Medical Research in London.

Instead of following the 'latest' trends in immunology like tissue and organ transplantation, the FMR has attempted to solve some of the major medical problems of our country like leprosy, multi-drug-resistant tuberculosis, waterborne diseases and testing of medicinal plants.

The FRCH was simultaneously established to study the health and medical problems of the majority of our people who live in rural India. These two institutions, working in tandem, provide a more satisfying and unique approach by studying both the social and scientific aspects of health problems for prevention and cure to help achieve the cherished goal of 'Health for All'. Both have received international recognition for their work and their original achievements.

We were fortunate to have Naval P. Godrej, a unique industrialist, as the chairman of both these institutions since their inception. He not only supported both foundations financially, but he actively participated in a remarkably non-intrusive but highly effective manner for which he deserves due credit.

Though the two foundations have different identities and separate boards of trustees, they had me as a common director and Nerges Mistry as joint director, so that they can function as a single field and laboratory unit—a rare combination, indeed!

Both these institutions have helped introduce a large number of young women and men to a new approach to the health problems of our country which are relevant to the needs of our people, especially the majority who need it the most. Over the past three decades, many of these students have become senior researchers in the medical and social

sciences, and have also started their own institutions. They continue to be my friends and colleagues. Many among our staff have worked under my guidance and then have gone on to do better than I have. This is as it should be for they stand on my shoulders, and not sit on my head!

I am pleased to state that at my age I have handed over the directorship of both these institutions to my colleague Nerges Mistry who has been closely associated with me over the past three-and-a-half decades in both these foundations, though I remain a trustee.

The reader may feel that these institutions, operated with limited funds and resources can hardly compare with the megalithic 'temples of learning and research' that have spawned in our country following independence using vast public resources and funds. But I believe that these small institutions have proved what Gandhiji also believed in: that small is not only beautiful but often more relevant and cost-effective.

Home and Abroad

I have travelled extensively in India and abroad to attend conferences, engage in collaborations, give lectures and generally observe medical practices in other countries. The experience has been a mixed one: the work being done in surgery and health care in some countries is impressive; in others less so. One of my happiest experiences is right here in India, in the state of Kerala, a medical and scenic marvel.

KERALA

I have been associated with the state for many years and am fascinated by how different its people are from those in other parts of our country with whom I am equally familiar. Almost everyone is educated, including the women, and the state's social development indices are higher than other states in our country.

Kerala has had extensive contact with people from other parts of the world because of its flourishing spice trade. The Europeans stayed on to become planters of spices and tea. Modern-day tourists have discovered the scenic charms of 'God's own country', as the tourism ministry describes the state in its many well-produced advertisements. But many of

its own educated people go abroad to earn their livelihood. Yet they invariably return to this twice-blessed land.

There is little difference between the cities and the villages that one passes on the roads. People lead a simple life and it is a common sight to see men and women from all strata of society sitting at home or in local teashops reading the morning newspaper. It is no wonder that India's highest-selling newspaper is in Malayalam. The minimum wage in Kerala is Rs 120 a day—enforced by the workers themselves—and is twice the national minimum wage.

I have been associated with a number of institutions in Kerala and hence came to know the state quite well. In 1996, I was appointed chairman of the health section of the state Planning Board. During the Ninth Five Year Plan, when Professor Iqbal Gulati was chairman of the state Planning Board, he invited me to participate in the various health activities of the state.

I was also asked by the eminent surgeon M.S. Valiathan to chair the advisory committee of the Achutha Menon Centre for promoting rural health care in Kerala. Valiathan was the director of the famous Sree Chitra Tirunal Institute for Heart and Nervous Diseases and its Biotechnology Institute in Thiruvananthapuram. He is an outstanding surgeon, researcher and scientist. In the biotechnology department of the Sree Chitra Tirunal Institute he developed innovative appropriate technology such as plastic blood bags. The institute has a biotechnology museum where prototypes of some pioneering technologies are displayed. One of two heart valves I had devised at the J.J. Hospital is displayed here. The story of this heart valve is an interesting one.

Meherji Mehta, a surgeon who was pioneering cardiac surgery, showed me two imported heart valves which consisted

of a circular wire cage. Inside the cage floated a very light metal disc. Since the valves were very expensive, I suggested we manufacture them in our country. However, nobody was willing to do so. I borrowed one of these imported valves from Dr Mehta and tried to copy it. There was no difficulty in fabricating the cage, but a plasma gun was required to solder the two halves of the light stainless steel floater. A plasma gun was only available at the Bhabha Atomic Research Centre in Bombay. I requested Homi Bhabha, father of India's nuclear programme, to help. We thus succeeded in making two valves, one of which was inserted into a patient at the J.J. Hospital. The second one is in the biotechnology museum of the Sri Chitra Tirunal Institute in Thiruvananthapuram.

Valiathan delivered the third N.H. Antia Oration in Bombay in 1995. It was he who recommended my name for the Birla International Award for Humanism, which I was awarded in 1994.

During my five-year stint on the state Planning Board I studied the excellent health care system of Kerala and also got the opportunity to see how its other institutions worked.

I would sit in on village gram sabha meetings where the sarpanch was often a woman. In contrast to the rest of our country, I found that villagers here, both men and women, actively participated in village politics and other activities. Even more unusual was the fact that many of these meetings were attended by a retired senior officer, who sat quietly among the villagers and provided technical or political advice, as and when required. These village meetings ensured proper utilization of 40 per cent of the plan budget that was directly allocated to each village.

This was true Panchayati Raj as visualized by Gandhiji, and local politicians and bureaucrats supported it. All development

activities were transparent; the state Planning Board provided information of all the programmes and funds meant for each village.

This transparent form of governance explains in part why Kerala has achieved so much in health care. It spends twenty-five dollars per capita per annum on health, reaches all sections of the population and has an infant mortality rate (IMR) of 16 per 1,000 live births.¹ The US spends \$4,600 per capita per annum and has an IMR of 7.0 per 1,000 live births.²

Historically, Keralites have always been keen to embrace advances in health care. The princely states of Travancore and Cochin encouraged the setting up of hospitals as they had done for schools. Education was used to spread the good practices of health and hygiene. The large number of nurses from Kerala in all parts of our country and even abroad attests the emphasis placed on health care in the state. The education of women contributed to reducing the birth rate to 14 per 1000, which is below the replacement level. The total fertility rate in Kerala is 1.8; the national average is 3.3.³

Kerala is a good example of how education and information can empower people and create a more egalitarian society. The erstwhile royal rulers set up many schools because they considered education necessary. Christian missionaries made use of this network and did much to spread education in the state. In the two princely states of Travancore and Cochin, 80 per cent of all girls in the primary age group were attending school in 1950. Education was seen as desirable

for all, including girls, and salaried employment for women was accepted here long before it became acceptable in other parts of the country.

The important role women played in society can perhaps be traced to the matrilineal system that is almost unique to this state. There was no practice of child marriage, no heavy dowry burden and the marriage ceremony was usually a simple one. The bride did not leave her home and always had a share in the ancestral property. Though the system is diluted now, women still have a stronger sense of identity here.

Kerala has also benefited from motivated organizations like the Bharat Gyan Vigyan Samiti under the leadership of M.P. Parmeshwaran, which is spreading education and information to other states of our country.

I was fortunate to have had such a close association with this state, which is unique not only in India but also in the world for it has provided a new dimension to socio-economic and human development.

THE UNITED STATES OF AMERICA

My first contact with medical colleagues from the United States was at the first World Health Organization (WHO) conference on Rehabilitation in Leprosy in 1958 at Karigiri, Vellore. I had been invited to present my experiences of the Kondhwa Leprosy Hospital with special reference to corrective surgery of the deformed face, which I had pioneered in that institution.

It was here that I met Joseph M. La Rocca who represented the department of health, education and welfare of the US, and who was later to become a personal friend. He was a self-effacing man dedicated to allay human suffering. He was

¹ National Family Health Survey, 1998-99.

² National Centre for Health Statistics, 2002.

³ Registrar General of India

keen to put to good use the massive PL-480 funds that had accumulated in India as a result of large-scale food aid.

La Rocca was impressed by my dramatic, original presentation on the correction of facial deformities in leprosy, that we had carried out at Kondhwa. He was more impressed by the way we had integrated leprosy patients into the wards of the J.J. Hospital—a government-run non-missionary hospital—for the first time in history. He saw this as a way of overcoming the physical and social stigma attached to leprosy. He asked me to apply for a grant to help promote my work in this field.

To someone dependent solely on the meagre facilities provided by a bureaucratic government, the grant, which started in the mid-1960s and continued till 1973, offered an unexpected opportunity. It allowed me to implement new techniques for corrections and rehabilitation of both leprosy and burns patients. Eventually, I was also able to undertake research in these areas.

As I have explained earlier, the infusion of these substantial funds allowed us to rapidly develop the Tata Department of Plastic Surgery (TDPS) at the J.J. Hospital. This contact led to an exchange programme between our department and similar institutions in the US supported by the department of health, education and welfare (HEW). It also enabled me and members of my staff to visit numerous institutions in the US on exchange programmes in various other disciplines.

My first visit to the US was on my way to an international leprosy conference in Rio de Janeiro, in 1963, which was sponsored by La Rocca's department. In New York, I visited the plastic surgery department at Cornell University. Dr Herbert Conway, the chief of this department, reciprocated with a visit to our department in Bombay a few years later.

This was followed by a visit from his senior resident, Dr James Smith, who trained for three months in our department at J.J. Hospital. Smith, now a well-known cosmetic surgeon in New York, was chiefly interested in the study of the micro-circulation of the peripheral nerve in the normal cadaver. This provided a new insight into nerve damage in leprosy. It also helped us devise new operative procedures such as surgical release of nerves to prevent and relieve nerve damage in leprosy, which is the cause of the majority of the deformities of the hands and feet.

On this first visit to New York, Arnie and I also had a taste of the effusive nature of American hospitality. On our many subsequent visits, we were to enjoy this hospitality in various parts of the country, and particularly with Joe and Margaret La Rocca at their home in Maryland on the outskirts of Washington, DC. Here, we first enjoyed the unforgettable sight of flowering azalea blossoms in spring and heard the delightful song of the mockingbird.

I was encouraged by La Rocca to visit various centres in the US involved in leprosy and burns. I also gave several lectures in the US and attended various conferences. In 1973, I delivered the Kiskadden lecture to the American Society of Plastic Surgery.

The main centre for leprosy patients in the US, at Carville in the state of Louisiana, also undertakes surgery, rehabilitation and some research. Several doctors who worked in Vellore, such as Paul and Margaret Brand, and Dr Job later joined as its staff. Carville was a pleasant centre where about 300 leprosy patients were isolated and kept in comfort. A surgeon who worked there, Dr Carl Enna, visited TDPS in Bombay and a close personal friendship sprang up between us. He was our guest in Bombay during other visits. During one

such visit he collaborated with me on our first book *Leprosy Surgery and Rehabilitation*. I also visited Dr Charles Shepard at the Communicable Diseases Center in Atlanta to study his pioneering work in growing the leprosy bacillus in the footpad of mice. At the National Institute for Health in Bethesda, a premier medical research centre in the USA, I met Dr Chang who was undertaking research in leprosy. Unfortunately, he suffered from severe leprophobia and asked me to examine him to make sure he had not contracted the disease! It was interesting to note that the fear of leprosy even pervaded this world-renowned medical research institution where work on far more infectious diseases was carried out.

At the well-known Rockefeller Institute for Medical Research in New York I met Dr Zanvil Cohn and his colleague Dr Gilla Kaplan who later visited us at the Foundation for Medical Research.

I had many other medical contacts in the US, not just because of the HEW programme but also because several American surgeons visiting Vellore would stop over to see our work in Bombay. One of them, Hugh Johnson, a plastic surgeon from Rockford, Illinois, spent three months as a Fulbright scholar in our department. This resulted in a close friendship with him and his family that lasted for several years. We met again when I delivered the Malinec Lecture at the American Society of Plastic and Reconstructive Surgery in 1984.

Hugh Johnson was the first plastic surgeon at the Mayo Clinic, and he arranged for me to visit this famous medical centre where I gave a lecture on surgery of the face in leprosy to the ENT department headed by the famous Dr Figi. I also delivered a lecture to the Neurology department, headed by the equally well-known Dr Peter Dyck, on our studies on the

peripheral nerve in leprosy. It was also at the Mayo Clinic that I met the world-renowned plastic surgeon Dr Ian Jackson, who often visits India.

There was much I could learn from all the medical centres I visited, but it is always necessary to pick and choose technologies and methods that are appropriate to our Indian conditions and requirements. In some of the sophisticated burns units in the United States, the cost of a bed was US\$5,000 a day, which was well beyond the needs and ability of our burns unit at TDPS and elsewhere in our country.

However, I could immediately see the advantages of an interesting and new type of external facial prosthesis being used in a small department at the burns centre in Galveston, Texas. I had come to see the potential of this new technique of facial prosthesis for the correction of facial and ear deformities, which could eliminate the need for extensive and painful reconstructive surgery. The department was headed by Dr Paderowski, who used silicone rather than the hard dental stent that I had seen at the Mayo Clinic. Dr Bulbulian, head of the dental department of the Mayo Clinic, had devised a facial prosthesis to cover large facial defects, especially the ear, which is extremely difficult to repair with plastic surgery. An artist in his department demonstrated how he could make an artificial ear out of a dental acrylic compound, which could be coloured to match the shape and colour of the other ear of the patient. This could then be glued in place. This was feasible in cases where considerable defects of the face resulted from trauma or surgery.

The silicone used by Paderowski, however, was both cheaper and aesthetically superior. Hence, I paid several visits to the Dow Corning Center in Midland, Michigan, which was pioneering the use of silicone in surgery. Dr Silas

Braley, a chemical engineer who pioneered this new medical field provided me with large quantities of various silicone products free of charge. This encouraged me to set up the facial prosthesis and implants section at the J.J. Hospital.

To do so, we needed someone with the appropriate training. We sent a young lady, Shernaz Kavarana—who was actually a law student but had a flair for sculpture—to study with Paderowski at Galveston for nine months. Within a few months of her return, she was producing excellent prostheses tinted to the required colour of our patients. In turn, she trained a student of sculpture from the J.J. School of Arts in Bombay, and he in turn trained a ward boy from our department to produce these prostheses.

I had been informed that learning such a sophisticated technique would require extensive training in the US. But all those we trained achieved good results within a few months. In fact, the facial prosthesis and implant section in the plastic surgery department at the J.J. Hospital still functions under the direction of the one-time ward boy! He also produces silicone nasal, chin and finger joints, which have proved to be superior to imported varieties that cost over Rs 5,000. Unfortunately, most surgeons prefer the imported varieties to the superior product of the plastic surgery department of the J.J. Hospital that costs a mere Rs 750.

My friend Dr Joseph Murray—who received the Nobel Prize for his work on overcoming the immune rejection phenomenon during kidney transplantation—recommended me for the honorary fellowship of the American College of Surgeons, the apex surgical institution of the US. I received this honour in Chicago in October 1979. The award is given to only 100 living fellows, and I was only the second recipient from India.

My interest in rural health led me to establish a close relationship with the well-known public health institutions of the Johns Hopkins Medical School in Baltimore and the Harvard School of Public Health in Boston. I have enjoyed my several visits to Boston, especially my meetings with Dr John Constable, the head of the plastic surgery department of the Massachusetts Hospital. Constable and his daughter, Isabel, brought a group of wildlife enthusiasts to India in 1984 to visit Indian wildlife sanctuaries.

Constable also sent Dr Fredrick Finseth, his senior resident, for three months' surgical training to our department at the J.J. Hospital. Since then, Finseth has visited India several times and has interacted closely with my staff and myself. He is a fellow of the Association of Rural Surgeons of India and was instrumental in establishing the Antia-Finseth Award, which is given annually to anyone who demonstrates his or her ingenuity in advancing surgical care for the rural poor. Arnie and I visited the Finseths in San Francisco and at their holiday home in Yosemite. The visit is among our happiest memories.

The natural splendours of the vast country—the Yosemite National Park, New England, in autumn, the Grand Canyon, and Booth Bay in Maine—have left an indelible impression on Arnie and me. I often wonder how this vast country would have developed had it been left to its original inhabitants, popularly known as 'Red Indians'.

My interaction in the United States with a large number of people from my own discipline and from other disciplines has been both stimulating and enjoyable. Though we have close friends in the US, I reject their unquestioning acceptance of science and technology as their gods, though they make useful slaves if used with wisdom.

Our son Rustom now lives in the United States. After graduating in physics from the IIT, Bombay, Rustom attended postgraduate courses at Amherst in the US, and at the Imperial College, London. As an academic he lives in an interesting enclave of university professionals in Atlanta, with his wife Veronique, and children Alice and Roshan. He is presently at the Emory University.

Our daughter Avan, a graduate from St Xavier's College in Bombay, also studied in the US. She did her masters in life sciences from Stonybrook, Long Island, before going on to do her PhD in marine biology from the University of Kiel in Germany. She lives with her husband Wolfgang, and children Maya and Carl in Kiel, Germany.

Although Arnie and I have enjoyed many visits to the United States, which provide us happy memories, I strongly oppose its political and military adventurism.

BANGLADESH

My first visit to Bangladesh was in June 1989 at the invitation of BRAC (Bangladesh Rural Advancement Committee), the largest voluntary organization in the country. The meeting was sponsored by foreign donors and was conducted along the lines of similar meetings held in affluent countries. Arnie and I had been invited by Dr Lincoln Chen, former director of the Ford Foundation in Delhi. The delegates were put up at the five-star Sonargaon Hotel in the capital city of Dhaka.

Following this meet my wife and I took the opportunity to visit Dr Zafrulla Chowdhury at his institution Gano Swasthyo Kendra, at Savar, about forty kilometres from Dhaka. Dr Chowdhury is known for his training of village women in health and other socio-economic activities. This was of interest to me because their health programmes were similar to the work we were doing in Mandwa.

Dr Chowdhury arranged for us to meet another developmental pioneer, Dr Mohammad Yunus, founder of the Grameen Bank, which started the practice of lending small amounts of money to poor people, particularly women. As I write this, I am informed that Dr Yunus and the Grameen Bank have jointly been awarded the 2006 Nobel Peace Prize, a deserved honour.

Dr Yunus spoke to us for an hour in his office in Dhaka and told us how the seed of the idea of starting the Grameen Bank came from a small loan he gave to his poor servant when he was an economics professor in Chittagong. Not only did the woman repay the loan, she put the money to such good use that it transformed her life. Today, the Grameen Bank is an international institution helping millions of women—more than 90 per cent of its clients are women—out of poverty. The concept of micro-credit that it pioneered has been replicated in many developing countries and is now seen as a powerful developmental tool. On a subsequent visit to Bangladesh, my colleague Dr Ramesh Awasthi and I visited one of these banks in a remote village and observed how the women operated it entirely on their own.

Dr Chowdhury did something similar at Savar. He returned to what was then East Pakistan after his training as a cardio-thoracic surgeon in the UK and participated in the struggle for independence as a member of the Mukti Bahini. After the newly named sovereign state Bangladesh won its independence from Pakistan, he moved to Savar. His vision was not to become a politician or to build a hospital in Dhaka, but to train local women in the villages to undertake health care of their own community. Subsequently, he built a small hospital at Savar as a supporting institution for his world-renowned health movement.

Savar was a stark contrast to the Sonargaon Hotel in Dhaka where we had stayed. It was typical of rural Bangladesh. The initial health activities had expanded to include a large rehabilitation centre for poor, divorced Muslim women. These women dressed in blue Mao suits were trained in various activities that would give them employment, such as carpentry, producing steel and plastic furniture and footwear. Though they came from traditional households, the women were now able to earn an independent living. They had learnt to overcome the inevitable opposition from orthodox religious leaders of their community. Many had learnt to drive jeeps and it was a common sight to see one of them driving Dr Chowdhury into Dhaka and various other parts of the country and even serving as his bodyguard!

Village health workers undertook nursing and all other duties in the small hospital. The person in charge of the operating theatre was a local woman who had studied only up to the tenth grade, but had conducted over 5,000 tubectomies under local anaesthesia on her own.

A fairly large pharmaceutical unit had been established in this campus to demonstrate how high-quality drugs could be produced at remarkably low cost, within the country, chiefly by village women and a couple of trained supervisors. Zafrulla Chowdhury did this to oppose the multinational pharmaceutical companies that controlled drug import and distribution at a price that the majority could not afford. It goes without saying that there was much opposition to this and Chowdhury was under pressure from his own government, and from international agencies that threatened to withdraw from the country. He was also not very popular with members of the medical profession who prospered by serving the small elite population of the country concentrated in Dhaka and the larger towns.

What I saw at Savar proved that a single individual could succeed despite opposition from religious heads, members of his own profession, and from the elite who had no objection to living their affluent lifestyle cheek by jowl with abject poverty. Chowdhury not only provided health care and cheap medicines for the poor, he also demonstrated what women could achieve in a traditional society when given the opportunity.

Over the years we have shared a close personal relationship. He was keen to introduce plastic surgery in his medical programme at Savar and at his new hospital in Dhaka. My colleague, Dr Swaran Arora, who succeeded me as head of TDPS, theatre nurse Malini and I went to Savar. Dr Arora and Nurse Malini performed over a hundred major operations in a month using the simple yet efficient services of the Savar hospital. The operations included severe burns contractures, cleft lip and palate and other major plastic surgery problems.

The quality of the results that we achieved created a demand for more exchanges between the plastic surgery department at the J.J. Hospital and Savar. This gave Arnie and me the opportunity to see more of Bangladesh on our subsequent visits. We saw both the stark poverty of the country and also what can be achieved despite political and professional opposition. I have managed to achieve this in the sphere of health in our own country to some extent.

I also visited Dr Chowdhury's new medical college in Dhaka. Some cases of severe facial acid burn were sent from here to our burns unit at the J.J. Hospital for reconstructive surgery.

In December 2000, I attended the first International Congress of the World Health Assembly in Dhaka, which

was attended by representatives from ninety-two countries. It proved to be a milestone. The congress demonstrated ways of making health and medical care accessible to the vast majority of people who have no access to such facilities in poor countries as well as some affluent countries. The conference was attended by over 1,600 delegates and raised health consciousness on a worldwide scale and involved even the World Health Organization.

I attended the conference as chairperson of the Indian section of the People's Health Movement and my book *Health and Medical Care: A People's Movement* (with G.P. Dutta and A.B. Kasbekar) was released by David Werner, the author of *Where There Is No Doctor*.

Prior to the meeting at Dhaka I attended the National Health Assembly in Calcutta (now Kolkata), which was attended by over 2,000 representatives including doctors, government officials, politicians, delegates from non-governmental organizations and peoples' movements, village health workers, and researchers and educationists from various parts of our country and from abroad to discuss the crisis facing our health care system. Here I met like-minded people from all over the world, like Dr Halfden Mahler, former director general of WHO, during whose tenure the Alma Ata Conference of 1978 was held which enunciated the 'Health for All' initiative. Mahler recalled that all countries had signed the declaration that asserted universal primary health care as a right, and committed member countries to provide health for all by the year 2000.

CHINA

China, like India, is the product of an ancient civilization. Large parts of the country escaped colonization though not without a struggle. China fortunately escaped recolonization

after the Second World War partly due to the presence of the USSR, but mainly due to the leadership of Mao Zedong who, by closing the doors of his country to external—particularly Western—influences, liberated the vast latent energy of the Chinese people.

My first contact with China was through the late Dr Ma Haide, who was Mao's personal physician from the beginning of the revolution till Mao's death. He had participated in the Long March with his wife Soufei. Ma Haide was a Palestinian American whose real name was George Hatem. He trained as a dermatologist in the US. On a visit to Shanghai he was revolted by the exploitation of the poor in China and joined Mao.

I met Ma Haide at the International Leprosy Congress in New Delhi in 1984 where another Chinese doctor, Li, presented the remarkable achievement of China in reducing leprosy from 500,000 to 50,000 in the thirty-five years following the revolution. I confirmed this startling fact with Dr Lechat, the president of the congress, who had also visited China. As the chairperson of the first session on Social Science in Leprosy, I expressed my admiration of this remarkable achievement of the Chinese. Ma Haide thanked me personally for the compliment I had paid his country.

In 1984, Arnie and I visited China at the invitation of Dr Song, a plastic surgeon, to attend the first meeting of plastic surgeons in Beijing. This was a few years after the death of Mao when China had started opening its doors to the outside world. I was invited in my capacity as the president-elect of the next International Congress of Plastic Surgery, which was to be held in India two years later.

An old tuberculosis sanatorium in Beijing had been converted into Dr Song's plastic surgery centre. Dr Song, a

descendant of the old Chinese aristocracy, had invited a strong European and US contingent as well as a few Indian plastic surgeons. A plastic surgeon from the US performed the first plastic surgery and, interestingly, it was a breast implant on a Chinese actress! This indicated how values were beginning to change in the country. I, on the other hand, presented our experience in the surgery of leprosy.

An extensive post-conference sightseeing tour of Beijing had been arranged for the Indian delegates. We were charmed by the parks, palaces and other monuments, the famous opera house, the Tiananmen Square and the Imperial Palace. The roads were teeming with bicycles and there were hardly any buses or cars. The cyclists were mostly workers on their way home for the lunch break. We observed them happily playing mah-jong on the footpaths outside their small houses, which were usually near their place of work.

From Beijing we were taken to Nanjing and then by train to Xian to see the terracota army—a remarkable sight indeed. We proceeded to Chengdu for an awe-inspiring view of the largest Buddha in the world carved out of a hill on the banks of the river opposite the town of Leshan. Our final destination was Guangzhou, which had the first five-star hotel in China.

On our return to Beijing, Arnie and I visited Ma Haide at a Beijing hospital, where he was a patient, and also met his wife Soufei. At my request, Ma Haide arranged for us to see another aspect of China—the province of Shandong, which was not yet open to tourists. Dr Li, whom I had met earlier at the leprosy congress in Delhi, accompanied us as an interpreter throughout this extensive journey by road in a vehicle placed at our disposal by the government.

The visit to Shandong province gave us a different insight into China and its common people. We visited villages without

prior notice and once took shelter in a private home during a shower. We visited medical colleges where indigenous medicine and allopathic systems were taught. We also visited a leprosy hospital-cum-‘home’.

We were thus able to see rural China and not just the usual tourist spots. We were state guests at a banquet hosted by the mayor of Jinan, where the driver of our car sat and ate with us, as he did throughout the tour in this classless society. An amusing incident occurred at this banquet that involved old Dr Wang, a senior leprologist. He quietly tried to spirit away a half-bottle of mao-tai, a strong rice wine. He stashed the bottle in a plastic bag, which also contained our passports. Unfortunately, the bottle was not properly corked and there was considerable consternation at the hotel when it was discovered that the mao-tai had doused and ruined our passports!

We insisted on returning to Beijing to get new passports. The Indian ambassador, Mr Venkateswaran, was woken up by a phone call at around midnight and the situation was explained to him. He advised us to continue with our tour and assured us that he would issue us new passports on our return to Beijing. We did as he suggested and on our return to Beijing, we had tea with the ambassador while our new passports were being prepared.

My next visit to China in 1985 was at the personal invitation of Ma Haide to attend the International Leprosy Symposium. A new Leprosy Research Institution was to be inaugurated near Guangzhou. This, too, was part of the attempt to open China to the rest of the world. Since leprosy has traditionally been the domain of Christian missionaries, this symposium was dominated by old leprosy hands like Stanley Brown and Olaf Skinsnes. There were also a few Indian delegates sponsored by our government. But what the conference demonstrated

effectively was how China had reduced the prevalence of leprosy within three decades without the presence of missionaries. On the other hand India, with its high missionary presence, has the dubious distinction, even today, of being home to the largest number of the world's leprosy patients. China's achievement shows the importance of social and political factors in the control of diseases.

On my third visit to China in 1986, I was part of a delegation of the Indian Council of Social Science Research to a conference in Shanghai. This visit provided me a deeper and wider insight into the social and economic development and transformation of this socialist society following the departure of Chairman Mao. Several Chinese delegates proudly explained to us why, as prosperous expatriates, they had returned to their homeland with funds to support the revolution in its early phase.

My visit to the plastic surgery unit in Shanghai developed by Professor Ti Shen Chang was an interesting one. This unit is one of the largest plastic surgery centres in the world. It was developed during the revolution and thus in isolation from the rest of the world. Doctors at the centre demonstrated several pioneering achievements in plastic surgery. Despite very limited facilities, they produced excellent work. The Chinese had developed new techniques in microvascular surgery and had devised flaps of which we in India had no knowledge. They had not been recorded in international literature either. Their isolation from Western influences had helped them develop original techniques of reconstructive surgery, unshaken by the lure of lucre held out by cosmetic surgery.

Though Dr Chang was head of the centre, he lived in a small two-room house and could not invite me to stay with him. He arranged for me to stay in the Shanghai Hotel as a state guest. As I had experienced in Yugoslavia in 1954, all hospital staff

from the director to the ward boys were treated, both socially and financially, at par. Like all professionals, Chang had to spend two years serving in the villages since Chairman Mao insisted that everyone, including his minister of health, must do so. Chang said that this was a unique way of experiencing the conditions under which the majority lived and worked. It also helped him to evolve original and appropriate medical and surgical techniques to serve the needs of the people. This is very different from our experience in India, and my own, till I went to our villages.

Since I was already in Shanghai, Chang arranged for me to visit two fascinating, adjacent towns—Hangzau and Suchow, the 'Venice' of China. I was also scheduled to fly to Wuhan in the centre of China to give a lecture at the medical college there. Unfortunately, there was a storm in Wuhan, so all flights were cancelled. I was stranded at Shanghai airport, which was at that time not exactly a bustling airport. It was locked promptly at 11 p.m. I was literally out in the shivering cold on a November night, alone and miserable and, like Sinbad the Sailor, knew not what to do!

Suddenly a taxi materialized from nowhere and despite my fear of entrusting myself to a stranger in a strange place in a strange land at that hour, I had no alternative but to ask the driver to take me back to the Shanghai Hotel. This he did willingly and charged me according to the meter, and even gave me a receipt for the payment! All taxis were state-owned and no one accepted tips—in fact, they considered it an insult to be offered one.

Chang had also arranged for me to see several of the interesting sights of Shanghai like the embroidery factory where hundreds of girls worked, the theatre of acrobats, and the exotic zoo.

I was back in China in 1998—my fourth visit—to attend the fifteenth International Congress of Leprosy. During this visit I saw the dramatic transformation of this country to Western materialism. I was accompanied by my colleagues, Nerges Mistry and Vanaja Shetty. We were booked into a new five-star hotel situated among a jungle of concrete high-rise buildings, where payment was to be made in US dollars. A bowl of soup here cost as much as a substantial meal for four that we shared with my friend Dr Zou—who had previously visited me in India—at a local eatery in an old-fashioned street nearby.

Through these visits, that spanned over a decade, from 1984 to 1998, I saw how things changed in China and how a great civilization with its advanced culture can fall prey to Western influence. China had transformed itself from a country previously ruled by warlords to become one of the most egalitarian societies that the world had ever seen. Subsequently, it made an equally rapid transition to a polarized capitalist society without, however, losing its national self-respect. The equality though has vanished. This is in stark contrast to India, another equally ancient civilization that has not shed its colonial mentality even sixty years after gaining independence.

IRAN

I first visited Iran at the invitation of the International Labour Organization (ILO), in 1974, to present my work on the rehabilitation of leprosy patients. My wife preceded me by a week to attend the sixth International Conference on Rehabilitation for the Disabled as honorary secretary of the Society for the Education of the Crippled.

The organizer of the ILO conference in Iran, Dr Shaik ul Islamzade, was a prominent orthopaedic surgeon practising in Tehran. He was anxious that as an orthopaedic surgeon he should be chosen to head Iran's leprosy rehabilitation programme over Dr Siadat, a dermatologist, and he wanted me to convey this to the Shahbano, the queen of Iran, who was in overall charge of the country's leprosy programme.

Islamzade had arranged for us to stay in a five-star hotel in Tehran where we could dine on imported Texas steaks and partake of fine French wines while we watched bikini-clad Iranian women enjoying a dip in the swimming pool.

The then Indian ambassador to Iran, Ram Sathe, arranged for me to meet the Shahbano at the Niyavaran Palace. We were to meet at 12 noon, but it was 2 p.m. before I was ushered in to meet the Shahbano who was gracious enough to forgo her lunch to keep our appointment. During the meeting, in her small but elegant personal study, she told me of her interest in the surgical rehabilitation of leprosy patients for which a hospital had been built in the leprosarium at Meshad, in the north-east of the country. She showed me a photograph of herself with leprosy patients at this institution and apologized that she was shown wearing gloves. She assured me that she had used her bare hand when shaking hands with the patients, before the photograph was taken, but felt it would be awkward to remove the gloves merely to pose for the photograph, which also showed her wearing warm winter clothing.

She told me that she believed that leprosy was not a highly infectious disease and less so if the patients were under proper treatment. After all, she had four children and would have hesitated to associate with leprosy patients had she not been convinced that they were not infectious. She invited me to

return to Iran with a surgical team and use the new operating theatre that had been built in the leprosarium at Meshad by the French government.

So, the following year an Indian surgical team with Dr P.V. Joshi, my surgical colleague, Dr Urmila Vora, an anaesthetist, nurse Lokur, Walter Jennings, our physiotherapist, and I visited Meshad. The large leprosarium was located on the periphery of the holy city, which housed the shrine of Ali, the son of Prophet Muhammad. Dr Gairehman, the medical superintendent, gave us a tour of the leprosarium, including the large new ultra-modern operating theatre which, curiously enough, had remained unused for the past two years. The reason? The water tower for the air-conditioning plant had not been installed!

Adjacent to the big theatre there was a small 'septic theatre' much better than either the one at Kondhwa or at the J.J. Hospital in Bombay. Both theatres were built by the French under the direction of a French surgeon, Dr Kuhn who, though resident in Meshad, had not performed a single operation in the theatres in the two years since they were built.

During the six weeks that we worked in Meshad, we performed a large number of operations with the full cooperation of the patients, though the staff was not pleased at this intense activity, which was in marked contrast to the prevailing practice. I learnt that Dr Siadat, who was then head of Iran's leprosy programme, visited Meshad just once a year when he distributed money to the patients that was actually meant for improving the medical services.

While in Meshad we visited the tomb of the poet Firdausi in the town of Tus, near the Afghan border, as well as the homes of the poor where we saw how entire families participated in weaving the famous Persian carpets on simple wooden looms.

After I finished my work in Meshad I presented the Shahbano with a photograph album showing the results of our surgery on the patients. She was obviously impressed by the work because she told Dr Siadat, who was present at this meeting, that he must visit India and recruit doctors for Iran's leprosy programme with my help.

Dr Siadat did visit Bombay and we interviewed and selected several well-known leprosy specialists, but he refused to tell me what salary he would be paying them; all he said was that it would be as per the rates prevailing in Iran. But when I visited Tabriz some years later, where the doctors I had helped recruit worked, they complained that they were paid half of what newly qualified French doctors, who had never studied leprosy nor seen a leprosy patient, were paid.

On my following two visits I saw several other aspects of this lovely country of my ancestors, with its beautiful architecture, horticulture, and hospitable people. Though followers of Islam, they took pride in their origins in Zoroastrianism. They had retained Persian and not Arabic as their language. We visited Isfahan with its unique 'covered' market selling exquisite carpets, and also Shiraz where we stayed with Professor Farang Meher, the Zoroastrian vice chancellor of Shiraz University, and his wife Pari. I also visited a couple of primary health centres where local health workers proudly showed off stacks of imported antibiotics.

On one of my visits I flew to Abadan where I delivered a lecture on plastic surgery at the medical college. Abadan is Iran's major oil-producing centre and the flares from the many oil wells made a pretty picture from the air as I flew back at night.

Arnie and I also paid a brief visit to the provinces of Mazenderan and Gilan on the shores of the Caspian Sea after crossing the snow-covered Elburz Mountains.

While we saw no stark poverty in Iran, the contrast between the rich and the rest was marked, despite the country's vast oil revenues. The power of the Shah was then at its height and every house, shop and building prominently displayed his photograph.

On one of my visits, I requested the Shahbano to fly some of the leprosy patients to Tehran so that our surgical team could demonstrate leprosy surgery at the ultra-sophisticated plastic surgery and burns unit in Tehran headed by Dr Osanalu, the country's premier plastic surgeon. The suggestion did not go down well with the hospital authorities, but the Shahbano's request could not be ignored. Our team performed several major operations on leprosy patients who were flown in from Meshad. I watched some of these operations on a television screen while sitting in Dr Osanalu's office on the third floor.

As at the J.J. Hospital, the local Iranian plastic surgeons soon lost their fear of leprosy and wanted us to demonstrate more operations of this fascinating aspect of plastic surgery. Dr Osanalu also requested me to return with a team of Indian plastic surgeons who could teach his students. This marked a change since surgical teams usually came to Iran from Western countries. Dr Osanalu assured me that I could direct the surgery from the comfort of my room in the adjacent Sheraton Hotel using the two-way television screen while sipping whisky! It was difficult to convince him that this was not the best method of training surgeons.

It was clear to any observer of the Shah's regime that power emanated from the palace and permeated all aspects of life in this lovely country which was run on the wealth of the oil exported to the US and Europe under the vigilance and protection of the CIA. The royal family lived under

tight security. The Shah had to travel from his palace to the Majlis, the Iranian Parliament, by helicopter because several attempts had been made on his life. On each of the four visits I made to Iran I saw increased police presence, an ominous premonition of the impending revolt.

My last visit, in 1978, was as part of a visiting team of ten international leprosy experts to observe and make recommendations about the care of leprosy patients in Iran. We were flown to Meshad in the Shahbano's personal jet and then on to the leprosy rehabilitation centre at Becadeh, a large agricultural colony for the rehabilitation of leprosy patients. Here we saw how oil wealth was recycled to the West. French farmers operated the latest mechanized farming equipment imported from France at exorbitant cost, while the patients, though they lived in comfortable homes, were neglected by the resident leprologists. Members of our visiting team who did a careful survey of the patients, including microscopy, concluded that the patients received virtually no treatment and were highly positive, though the records maintained by the centre were to the contrary.

Except for the patients at the leprosarium in Tabriz, who were looked after by the Indian leprologists I had sent, most other patients received no care either from the local leprologists or from the Western doctors who also had a phobia for the disease. Yet Dr Siadat and his staff at his exquisitely furnished private dermatology clinic in Tehran, received 20 per cent 'danger pay' merely for opening letters sent by patients to this central leprosy office which was responsible for the leprosy programme of the entire country!

The report that was supposed to be compiled by us, as international leprosy experts, for the Shahbano, was in fact drafted by Siadat to suit his own requirements, and was never

shown to us. Both Siadat and Shaik ul Islamzade were shot during the revolution that overthrew the Shah and saw the return of Ayatollah Khomeini. They had not fled the country in time as Dr Osanalu had done, who went to Los Angeles.

THAILAND AND NEPAL

In 1979, I was invited by the World Health Organization as consultant to monitor the implementation of the Health for All strategy evolved at Alma Ata in 1978. This strategy had been accepted by nine countries of the SEARO (South-East Asian Region Office).

I had to attend the presentations that these countries made at a meeting in Delhi. I then had to follow this up by spending two weeks each in Thailand, Nepal and the Maldives to see how these countries implemented the strategy. I was unable to visit the Maldives due to lack of time, but during visits to Thailand and Nepal I observed how the culture and politics of countries influenced their health systems and the implementation of the Health for All programme.

The Delhi meeting was held in the imposing Conference Hall of the WHO office. The senior delegate, the minister of health for the Maldives, chaired the meeting and made a massive presentation. This was followed by Nepal's presentation, delivered by its health minister, which was only slightly shorter. Mongolia's presentation was the shortest of all, only a few pages. This was because they claimed to have already achieved the requirements of Health for All. Mongolia had no doctors or nurses till a few decades ago but, under a communist regime, they were able to achieve the desired results by training doctors, nurses and paramedics who visited homes across this sparsely populated land, often on horseback. Their experience revealed that the demands of Health for

All were in fact quite modest and can be achieved by a few motivated personnel if supported by their government.

The visit to Thailand was interesting not only because I could observe the health scene, but also because I could visit remote parts of this interesting country by bus accompanied by an interpreter provided by the ministry of health. The office of the ministry that looked after the Health for All programme was modest. It was housed in an enclosed veranda and its staff comprised one doctor and two paramedical assistants. I was told quite bluntly that my visit was not very welcome because it would further deplete the staff as one person had to be deputed to accompany me.

What I observed during this visit was in striking contrast to my visit to Nepal, which followed. Thailand was a country that had never lost its independence to foreign invaders and was ruled by a royal family that was respected by its people. The people were well educated and not servile to authority. Hierarchy and gender difference were not so marked and the medical staff spoke frankly of their problems as well as their achievements. Both male and female villagers actively participated in discussions with me. They also informed me that both male and female paramedics conducted deliveries!

On a visit to a public health centre (PHC) near the border with communist Cambodia, I came across a doctor who was a staunch communist and yet highly respected by the entire population for his devoted service. The PHC catered to all in a remarkably efficient manner. I observed throughout my visit a culture of cleanliness.

In the small town of Lampang, near Chiang Mai, an important city in northern Thailand, we met a remarkable person who was not a doctor, but had devised an unusual

non-coercive method for motivating people to achieve family planning.

Thailand, an independent country that had not been colonized and that has had a series of enlightened rulers, demonstrated that it could achieve the Health for All objectives even without WHO support. Though a relatively poor country, it made good use of its natural resources, supplemented by the discipline of its people, to achieve impressive health goals.

The capital city of Bangkok was, at the time, a pleasant city with beautiful temples. I felt that religion in this ancient civilization has probably played an important role in preserving the country as an independent nation with its own culture.

Unfortunately, my later non-official visits to this country showed the havoc that ad hoc acceptance of Western materialism had caused by providing 'rest and recreation' facilities for the US soldiers during the Vietnam War.

Nepal, which I visited next, was entirely different. There was great social and economic disparity between the ruling class and the people they ruled. One of the people whom I had to meet in Nepal was, in fact, the wife of a powerful rana, a bejewelled and scented lady who was in charge of the public health programme of the country, and who had made the long presentation in Delhi. She made it clear that she needed no advice from a foreigner and deputed her staff to arrange for my visit to the town of Pokhara by jeep. She wanted me to see the 'progress' that had been made in the country in health care, but it would be restricted to places along the only major highway of the country—from Kathmandu to Pokhara.

What I actually saw was the abject poverty of the people. It was the monsoon season and rivers flooded their banks carrying away the rich soil from the terraced hill slopes. I

remember being amused by a newspaper article that said that the new islands created in Bangladesh with all the soil from Nepal, should rightfully belong to Nepal!

I also met the local WHO representative, a Frenchman. He confided to me that the massive report and future planning for achieving the Health for All objectives in Nepal that was presented by the aforesaid lady in Delhi was actually written by him!

On the hills adjoining the highway I was shown two elegant health centres donated by the Japanese government. Built and equipped to Japanese standards, they were nevertheless poorly staffed and poorly utilized, possibly because it was difficult for patients to access these centres that were situated, very picturesquely, on top of hills, but could not be accessed by public transport. In Pokhara, though, we saw the low-profile but highly efficient Green Pastures missionary hospital, which provided good care to the poor including leprosy patients.

My wife and I visited both Thailand and Nepal several years later and saw a marked change in the capital cities of both countries. Thanks to the influx of modern tourists the urban centres had become somewhat affluent but together with that there was abject poverty and moral decay. Bangkok was severely congested and had lost much of the elegance I had seen and admired on my previous visit.

Kathmandu, Nepal's capital, had also become comparatively 'prosperous'. But on our treks in the mountains during our subsequent visits we saw stark poverty with virtually no health services even for basic medical problems.

ISRAEL

I have had two entirely different experiences of Israel during my two visits. The first visit, in 1966, was sponsored by the

Hadassah University in reciprocation to a visit by one of its doctors, Dr Magora, to Bombay to observe the rehabilitation of leprosy patients at the J.J. Hospital. Two of my colleagues, Dr Darab Dastur, a neurosurgeon, and Dr Shobha Divekar, were also invited.

On my way to Israel we attended an international rehabilitation conference on leprosy in Addis Ababa in Ethiopia, where many senior rehabilitation experts were invited.

Leprosy was rampant in Ethiopia. We were taken to see an ultra-modern rehabilitation centre and hospital in Addis Ababa that the Swedish government had built and equipped. The hospital was a replica of a modern hospital in Sweden. Patients came here from different parts of the country for treatment. They took such a liking to it that they refused to return to their homes, and instead set up a large leprosy colony surrounding the hospital. This posed a problem for the government. It was an example of how, with the best of intentions, affluent Western nations can create more problems in the course of solving others.

On our way from Ethiopia to Israel, we had to change planes in Cairo, where we got a taste of the hostile relationship that existed between Israel and Egypt. Dr Dastur, a Parsi, was mistaken for a Jew by the airport authorities due to his rather prominent nose, which is a typical facial characteristic of Jews and Parsis. We had to engage in lengthy explanations to convince the suspicious Egyptians that Dr Dastur was not a Jew and should not be hauled off to jail. It was a harrowing experience.

In Israel, we enjoyed great hospitality at the Hadassah Hospital and were also taken around the country. We visited a kibbutz, which was entirely manned by Bene Israelis from

the Konkan region of India. We asked them why they had left India to come and live in such a dangerous place, where they had to sleep every night in bunkers with rifles handy. They showed us all the modern facilities and amenities they enjoyed which they said they would never have had in India. Interestingly, we could only communicate with them through their children who spoke English as well as Hebrew and the Konkan dialect of their parents.

My next visit to Israel was for an international medical conference conducted by the Palestinian Medical Organization in Bethlehem, where the local residents lived behind barbed wire.

It was my turn to be harassed by belligerent Israeli immigration officers at Tel Aviv airport when we were leaving the country. They were suspicious of my visit to Bethlehem and delayed me with questions for so long that I felt they wanted me to miss my flight out.

My travels have taught me much, and I have laid bare in these pages what I have seen and learnt over a long career in the medical profession. Every trip had its surprises and its shocks that have, over the years, helped me understand the world and its ways of working.

Democracy, Panchayati Raj and Health Care

I have had a long career in medicine, as the previous pages say, and have learnt with every step. My experiences in India and abroad taught me that the practice of medicine, and particularly its application in the area of community health, is intimately connected to larger issues such as the nature and practice of different forms of governance. The reader will therefore excuse me if I take some space and time to explain how democracy and our system of Panchayati Raj impact the welfare of the masses in general and health care in particular.

Democracy has a universal appeal since it is generally taken to mean the rule of the people, by the people and for the people. Yet, throughout its history, democracy has been subverted by a minority that has used it to mislead the common people, and utilize their power to serve the minority's own personal ends. In the process, it is the vast majority who are overlooked. They are the prime creators of all wealth—the combined physical, intellectual and material resources with which nature has endowed us—that is appropriated by a few.

It is thus the needs of the common people that should form the basis of any true democracy, as Mahatma Gandhi said.

The root cause of disparities, conflicts, and the misuse of human and natural resources is the manipulation of people and nature by an opportunist minority. The economic disparity within our species is hence not a natural phenomenon but a manifestation of the insatiable greed of kings, dictators and now of industrial barons, multinationals and politicians.

In ancient times the all-powerful kings and the nobility used physical means to wield power over serfs. With the onset of the Industrial Revolution in the West, power shifted to the industrialists who did not possess the 'divine right of kings' to rule, and so resorted to a new and appealing strategy called 'democracy', to attract cheap labour for their factories from the villages. The representative form of democracy, which operates through the vote, offered equal rights to the labourers, who were always in the majority. This was an attractive lure for those who sought liberation from generations of serfdom to powerful landlords. It also offered the attraction of employment at better wages. But the wealth and power of the capitalist industrialists, derived from their factories, resulted in a far more ruthless form of monetary exploitation of those who laboured, under appalling working conditions in factories, and even worse living conditions in slums.

This form of exploitation in the garb of democracy also sundered the human relationship, however tenuous, that existed between the rural landlord and the peasant, and replaced it with a far more dehumanized relationship where the labourer would only serve as another commodity to be purchased at the lowest available market rate.

The ruthlessness of the capitalist machinery promulgated by urban industry has been well documented by the nineteenth-century novelist Charles Dickens. It is now visible in an equally vile manner in every country where capitalism has taken root, including our own. This is not to condone rural serfdom, or dictatorship, or even communism, which, though started as a more humanistic form of governance ended up in a centralized form of dictatorship.

True democracy, by its very nature, cannot be imposed on the people, but must evolve as a 'bottom-up' process encouraged by the people themselves. They are the primary functionaries as well as the chief beneficiaries. It, therefore, has to be in keeping with the people's requirements and must be a part of their culture. Its strength lies in its intimate, face-to-face relationship with fellow humans as also with nature, which supports them and provides them their livelihood. Hence, its base lies in the villages, not in the cities.

This form of governance is based on an understanding of the nature of *Homo sapiens*, and the greed for money and power, which is inherent in our species as in no other. Centralizing power and decision making invariably leads to distancing the decision makers from the people. This results in an impersonal relationship where people are mere objects from whom resources and power are extracted by manipulating their vote.

The Industrial Revolution in Europe saw the ruthless exploitation of man and nature on a scale that was inconceivable in the past, since its effect was felt in distant lands as well. To feed the Western factories, it was necessary to appropriate the riches and wealth of the ancient civilizations of Asia, such as India and China, as also of the Americas,

Australia and Africa. It is ironic that it was the same insatiable greed—this time for each other's colonies—that eventually led to their downfall and the consequent liberation of the colonized countries.

The emergence of the Soviet Union as a major power in the twentieth century prevented the military recolonization of the former colonies after the Second World War. Hence, a new strategy was devised called the Bretton Woods model after the name of the town in New Hampshire where the United Nations Monetary Conference was held in 1944 to plot the future of the post-war economy. What it did, in fact, was to activate a policy to regain control of the natural resources of the one-time colonies by co-opting the newly emerging leadership in the independent countries both economically and culturally.

This strategy of economic recolonization has proved most effective. It projects the West as benevolent, unlike their crude military adventures of the past. The latter method is still used to tame truculent leaders who fail to respond to the Bretton Woods strategy propagated by its two principal adherents, the International Monetary Fund and the World Bank, and those who oppose this new method of recolonizing their countries.

A major aspect of this new strategy of economic colonization was the promotion of the very seductive process of representative democracy that Western powers had so effectively employed in their own countries during the Industrial Revolution. The first generation of leaders in newly independent countries, trained in the West (like independent India's first prime minister, Jawaharlal Nehru) genuinely believed that urban industrialization would produce wealth and thus rapidly eradicate poverty. But the second and

subsequent generations, though aware of the fallacy of this argument, continue with the same model because it promises them an affluent Western lifestyle regardless of the fact that it increases the poverty of the masses.

This form of economic colonization has not only opened our doors to exploitation from the former colonial powers, it has also taught us to exploit our own country. Globalization, which encourages trade between unequal partners, has wrought havoc in developing nations and is no less harmful than what prevailed during the previous period of colonization.

The only way out of this web lies in informing the common people that under the guise of representative democracy and the vote, they continue to be exploited.

Fortunately for us in India, a historical form of decentralized democracy—Panchayati Raj—exists. Mahatma Gandhi had insisted that this was the form of governance appropriate for an independent India. He could see the dangers of adopting a Western, capitalist, urban, industrial form of development. He knew that there could never be a ‘trickle-down’ effect of wealth, since any wealth that was generated would be skimmed off at the top by the new elites, leaving the poor at the bottom no better off.

Panchayati Raj is designed as a ‘bottom-up’ approach. It puts resources in the hands of those who generate them and thus allows them a share in those resources. Those enamoured by the globalization–liberalization mantra see this as a form of regression, a sort of rustic utopia that is unrealizable and unattainable. But, in fact, it is the right way forward and the only way the huge potential of a country like ours can be unleashed. It is also a more just and equitable form of governance than the one we currently practise, where elections are a means of gaining power by using money and muscle,

though it is disguised as a means of serving the society—a disguise that is increasingly wearing thin.

Neither democracy nor dictatorship can give us a just government, but the old system of Panchayati Raj can because it checks the misuse of power (since the seat of power is not in some distant city but in one’s own backyard as it were) and because it checks the other great threat to human life and happiness—the degradation of nature and the environment. People are less likely to sanction projects that will destroy their immediate environment (like building large dams) when they themselves will be the sufferers.

The rural health delivery system that the Foundation for Research in Community Health has evolved is based on precisely this approach, the ‘bottom-up’ approach, which puts medical knowledge in the hands of the people who need it and not in the hands of those who exploit it. Key to the whole effort of propagating Panchayati Raj is arming the public with accurate and detailed information on all aspects of development—economic, social and political. The recently enacted Right to Information Act is a powerful tool that can also be used for this purpose.

The current United Progressive Alliance government has appointed a minister for Panchayati Raj, but it is not in the interest of the political class to ensure that power really devolves to the people, so pressure has to come from the people themselves. People should do whatever they can for themselves, just as the people of Ralegan Siddhi, Parinche and other places that practise a similar philosophy have successfully done.

Science and Development

Science, to me, is the detailed and systematic study of a 'subject' through observations and creative analyses of those observations. Hence, science is concerned with the study of both social and physical phenomena. Unfortunately, science has now come to represent only observational or mensural study of physical phenomena. As a man of medicine, my own faith in science was very strong as I was brought up in the Western scientific tradition that emphasized on curative aspects of medicine and not on the social dimensions of health.

Over a period of time, however, I began to wonder whether we had made the right use of science: Had we not mistakenly elevated science on a pedestal? Science is meant for human welfare, but has it always been used to this end?

In the early hunter-gatherer period of civilization, the invention of tools such as spears, bows and arrows ensured an adequate supply of food as well as protection against animals and other tribes. It was through scientific discoveries that human beings were able to move on to the next step in the civilizational ladder, when they started cultivating crops and created settled agricultural communities. The ability

to create fire to cook food and use it as protection against animals was also an early and significant manifestation of the scientific approach. This inevitably led to a desire for a more comfortable and sedentary form of life. And it also led to raids on more prosperous neighbours using weapons created specifically for warfare.

Humans developed tools to extend their senses, such as the telescope and the microscope. This led to the development of a new form of science during the Renaissance in Europe, which enabled human beings to exponentially extend their knowledge and understanding of nature in a manner that had not been possible before. It led to a deeper study and understanding of nature and hence is called natural science. It was during this time that science suffered a major rift with religion and began to suffer from what I call its 'original sin'. The findings of Copernicus and Galileo invariably came into conflict with the papal establishment that dominated European society in the name of Christianity.

Science thus chose to divorce itself from spirituality. Scientists tried to understand nature in terms dissociated from philosophy or religion. It whetted man's appetite to know more about nature and, ultimately, exploit it. Need and comfort, which had been the driving forces behind many early scientific advances, were replaced over the millennia by insatiable greed, which is the hallmark of our species as of none other. Ultimately, it ceased to be 'natural' science altogether. It became Western science which spread with colonization to other spheres of the globe and assumed a position of dominance over other forms of sciences. Its end was to conquer nature and subjugate it.

This is a fallacy. Human beings are but a part of nature and hence cannot be its master. The discovery of the atom

and the DNA are significant, but they are only the elementary building blocks of nature; the universe and life itself are far too complex for human understanding. Merely because one knows that the Taj Mahal is made of marble does not explain anything about the beauty and the mystery of that sublime building which was created by the mind of its architect.

Unfortunately, we have been unable to convert the knowledge we have gained through the scientific approach into a more holistic understanding of the world around us. A greater understanding of the laws and principles of the universe should have made us humble; instead it has only made us arrogant. It has invariably led to the misuse of such knowledge and its technologies resulting in the creation of the atom bomb and the manipulation of genes. We have misused rather than made wise use of the knowledge and technologies developed by Western science.

A deeper understanding of nature and of the universe requires a different approach. It can be sought in the realms of philosophy and spiritualism, which attempt to understand subjects that are beyond the grasp of the material sciences. For example, the comprehension of zero and infinity, which is a basic concept of mathematics, is the product of an understanding that goes beyond the numerical.

Prophets and wise men have given us an understanding of human nature and social values that guide us in our daily existence. These values are too complex to be understood through the social sciences taught in our universities. Material science fails to appreciate the intricacies of the interaction not only between humans, but also between human beings and nature. And a consequence of this is uncontrolled exploitation, hatred and violence.

Developments based on Western science and technology is founded on greed. It has gone on to corrupt the three

professions that are above material values—that of the teacher, the preacher and the healer. The scientist should also be included in the final category. The malaise is evident in the field of medicine.

Common sense informs us that health is chiefly a non-medical function based on factors such as nutrition, water, sanitation, housing, employment and environment. Under conditions of abject poverty in the villages and slums, the health of 85 per cent of our people has been converted into illness, which is expressed in the form of diseases. This in turn has given rise to the health industry which is controlled by pharmaceutical and instrumentation companies. It is one of the fastest-growing industries that has turned into a social disease—the rich are overmedicalized, the middle class is pauperized while the poor are just left to themselves. Instead of addressing problems at the grass roots we concentrate more on replacing worn out knees and prolonging the inevitable in intensive care units. The charts plotted by the epidemiologist McKeown should humble scientists and lead them to look into the question of health from a holistic point of view. He showed that improvement of environmental conditions by reformers in Britain during the sanitary revolution of the nineteenth century led to effective control of several major diseases like TB, cholera and whooping cough in the absence of conventional biomedical tools. We must strive towards what the Macy conferences did for the study of human behaviour in the mid-1940s. It brought together interdisciplinary figures like the anthropologists Margaret Mead and Bateson and the philosopher mathematician Werner, who looked beyond the mechanisms of communication in living things to identify patterns and relate them to a wide range of social and cultural issues. They were thus able to do pioneering work in family therapy, alcoholism and schizophrenia.

Birth, life and death are part of a continuous phenomenon since nothing material or non-material like the mind can vanish into nothingness. It can only change its form and expression. Prophets and wise men have known this instinctively and have explained it in philosophical terms as an unseen and unquantifiable phenomenon of which we are but an infinitesimal part. This should intrigue our imagination and make us humble. Instead, we use science, which has no inherent values of its own except what we assign to it, to conquer both our fellow beings and nature in order to satisfy our greed.

With his usual understanding and foresight, Gandhiji had warned of the dehumanizing and exploitative nature of a science devoid of human values, and the havoc it could play. Its superficial capabilities and glamour conceal an underlying aggression and exploitation that is used to suppress traditional mores and values. Gandhiji's adage that there is enough for everyone's need but not for the greed of even a few has now come true.

Only thus can we explain how Western science has created worldwide poverty and misery despite its ability to provide for the health and happiness of all. The message is that this science and technology, devoid of social values and restraints, provide the means to pander to human greed as never before. It has inevitably resulted in exploitation of both man and nature on a scale inconceivable in the past, by degrading rather than enlightening the minds of those who control it.

However, the scientists who produce the basis of this knowledge must be differentiated from the technologists who merely exploit the knowledge for their own ends.

To conclude, I would like to quote from Needham's remarkable study, *Science and Civilization in China*:

Francis Bacon had selected three inventions, paper and printing, gunpowder, and the magnetic compass, which had done more, he thought, than any religious conviction or astrological influence, or any conqueror's achievements, to transform completely the modern world and mark it off from antiquity and the Middle Ages . . . he died without knowing all of them were Chinese [inventions]. We have done our best to put this record straight.

It remains to be seen whether we realize the limitations of Western science. In health and medicine, it is time for us to integrate our age-old culture of health and practices with the most relevant aspects of Western science to ensure the greater good of all and not turn health into a commodity that only a few can purchase.

Epilogue

I have always believed in 'simplifying the complicated'. Medicine could be considered as a most complicated activity. My training, from my earliest days, however, has been in the direction of reducing these complications to their simplest forms.

Doing this was interesting, but it also often meant swimming against the tide of increasing sophistication that is the result of our imitative Western mode of development. I looked at this as a challenge, and also as a necessity in an age when mass poverty exists cheek by jowl with the excessive affluence of a few.

Simultaneously, my interests moved me to understand the basis of Western science and technology which we had adopted ad hoc for our country's development and which was most evident in the medical system. I took two years off from my surgical career in the late 1960s to study the basis of 'modern' medical science at the National Institute for Medical Research in London.

Medical research did not, as one might expect, isolate me from the more human side of medicine. On the contrary, it impelled me to view medicine in a wider perspective, not

just the hospitals and laboratories, but the socio-economic, cultural and political aspects of medicine. I came to realize that we were adopting an increasingly expensive medical system for diseases chiefly related to poverty.

This resulted in the establishment of two major institutions, the Foundation for Medical Research (FMR) and the Foundation for Research in Community Health (FRCH) in 1975. The FMR was research-oriented and the FRCH developed my growing interest in community health care. The latter inevitably led to an understanding of how such a health care system should be developed and delivered. My involvement in the 1981 ICSSR-ICMR report, *Health for All: An Alternative Strategy*, furthered that understanding.

Over time, and with our project in Parinche bearing fruit, I became convinced that the people's sector is crucial for a sound and widespread health care system in a country such as ours. And we can achieve it with Panchayati Raj and the recently introduced right to information. My association with Anna Hazare, whose extraordinary work in Ralegan Siddhi embodies the letter and spirit of the community model of development, only reinforces my conviction that a new decentralized model for development of health services is the way forward.

Some of this is realized in the present National Rural Health Mission of the Government of India. It has created a new cadre of village health workers supported by a simple but effective medical service at the grass roots that can undertake about 90 per cent of the health and medical problems of our people within a 30,000 population level as was originally recommended by the Bhore Committee in 1946. As I have said earlier, I have my reservations about this system, particularly about the manner in which the ASHA has been co-opted into

the bottom-most layer of the hierarchy. The concept of the 'tai' and the manner in which she operates in Parinche is, I think, the right way to go.

I am always asked, inevitably, whether the Parinche community health model will spread and endure. I am no soothsayer and cannot see into the future. What I hope, though, is that as and when we embrace a more equitable form of development and governance, one in which the people's sector is pre-eminent, the health care system that FRCH and other voluntary agencies have devised will be adopted. It is a matter of being ready with the right idea and then waiting for the time to be right to spread the idea.

My prescription to cure the malady of poor health care for the majority of our population is based on six decades of experience not just in community health care, but also in a wide array of general and specialist surgery in some of the best hospitals in the country, and biomedical research into diseases and their causes. In my travels to countries of the East and the West, I have been exposed to new ideas and approaches to medical, surgical and political problems affecting health care in various parts of the world.

This accumulated experience makes me speak with some authority. The idea of village women being responsible for the health care of their village is not the ludicrous idea some think it to be. In a country of wide socio-economic disparities, it is unlikely that city-trained doctors will want to set up practice in villages with no running water, intermittent electricity and nothing in the way of recreation or entertainment. By the people, for the people, of the people then becomes a necessity, not an option.

On a more personal note, what do I hope for the future? Our hopes are usually tied up in our children and

grandchildren. I worry about what kind of world they will inherit. There are very real fears about the disastrous effects of global warming and other environmental catastrophes. The pundits say we are increasingly living in a 'global village'. Yet, I see none of the closeness and integration that such a term should promote. On the contrary, there is more strife, more divisiveness and less tolerance.

As I sit in my tree-filled garden in Pune, I feel thankful that I was, by and large, able to do what I wanted to do in life. I had set myself no great goals and had no great ambitions. Somehow, though, I travelled in a direction that has brought me satisfaction and a few worldly honours. If my grandchildren can say the same about their lives, I will be content.